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TABLE OF CONTENTS.

Editorial:	PAGE.
The New Tire Development.....	201
How to Start in a Rubber Factory.....	202
Minor Editorials.....	202
The Late "Boom" in Rubber Scrap.....	203
More About Rubbers in the Shoe Jobbing Trade.....	204
Some Experiments in Making Rubber Substitutes.....	205
Is the Caucho Trade in Peru Declining?..... <i>Fred J. Hessel.</i>	206
The Evolution of Fire Hose and Circular Hose Weaving.—I.....	208
..... <i>A Pioneer Loom Builder.</i>	208
Answers to Correspondents..... <i>The Editor.</i>	210
India-Rubber Industry Abroad.....	211
[Canada; Germany; Great Britain.]	
Recent Trade Publications.....	212
French Styles in Waterproof Garments for Women.....	212
[Fashion Plate.]	
A Few Novelties in Rubber Tires (Illustrated).....	213
[Peoria Hard and Soft Rubber Tires; A Rivet-Headed Tread; Pneumatic Hub Wheel; The "Wing" Tire.]	
New Goods and Specialties in Rubber (Illustrated):	
The "Globe" Nebulizer.....	215
New Method of Marking Tires.....	215
The "American" Puncture Locator.....	215
The "Sorosia" Cushion Heel.....	215
A New Use for Rubber Packing.....	215
Ramsey's Novel Cushion Tire.....	216
The Sanitary Rubber Ring.....	216
Dykes's Patented Rubber Heel.....	216
The "Sterling" Infants' Bath Tub.....	216
Brief Abstracts of Recent Rubber Patents.....	217
Some Wants of the Rubber Trade.....	218
The Multiple Stockinet Dress Shield Machine.....	219
[With Four Illustrations.]	
The Electric Vehicle People Invest in Tires.....	220
Miscellaneous:	
Conditions of the Balata Market.....	203
Where Our Rubber Exports Go.....	209
Chicle and Chewing Gum.....	214
Agency Wanted in England.....	214
Rubber Used in Mining.....	221
Large Machine for Sewing Belting.....	221
Advance in Canadian Rubbers.....	221
News of the Rubber Trade.....	222
Review of the Crude Rubber Market.....	226

THE NEW TIRE DEVELOPMENT.

TWO large companies are in course of organization in this country for the purpose of controlling the manufacture of rubber tires for vehicles, and particularly for automobiles. The promoters in each case happen to be persons who have earned a reputation for care in making investments, and their opinion that the coming of the new vehicles is assured, and that the rubber tire is essential to their success, is entitled to respect. There is reason to believe, indeed, that these gentlemen are right on both propositions. Hence the subject assumes an interest for the India-rubber trade as a whole, to be compared only with that which arose from the introduction of the bicycle tire a few years ago. There is this difference—that whereas no one could have foretold that the bicycle trade would grow to such large proportions, and nothing existed in past experience to prepare the minds of the trade for such development as took place in that respect, the growth of the bicycle industry can now be pointed to as suggesting what may happen in respect to the newer vehicles.

While not a necessary consequence, no doubt the development of automobilism will be hastened by the emancipation from the use of horses which the bicycle first made possible. Another consideration is that millions of people have been "spoiled," by the easy running rubber shod bicycle, for the use of any sort of vehicle without rubber tires. The element of noiselessness also tends to widen the use of rubber tires, as people learn to appreciate the injuries to health resulting from the constant din and jarring on the streets. In order to enjoy to the fullest extent the benefits of the rubber tire, the desirability of good streets soon becomes apparent. In time, therefore, the entering wedge of asphalted bicycle paths alongside the granite pavements in New York will be followed by smooth pavements from curb to curb, over every part of which rubber tired wheels of whatever description may run easily, comfortably, and noiselessly, and similar conditions will exist ultimately in every city and village in the country.

As for the rubber trade, interest in the new development will be confined at first to those who are in a position to manufacture the new tires, and it is to be hoped that these may escape the pitfalls into which some of the earlier makers of bicycle tires plunged. There is little danger that the trade will go blindly into the guaranteeing of vehicle tires, as so many did in the case of the bicycle tires; but there is also the danger to be avoided of "going into" the new tires before one really is prepared for it, or of selling tires for less money than a good article can be produced for, leading either to loss of profits or to demoralization of standards of quality.

Interest in the new development must extend finally, however, to every manufacturer of rubber goods, for the reason that a heavy demand for automobiles will only accentuate the difficulty of several years past in keeping the supply of material up to the rate of demand. Whatever adds to the rate of consumption of rubber, and particularly

if it be by leaps and bounds, means a postponement of the lower prices which some members of the trade still confidently look for. It means high prices for rubber goods, or low quality, or new discoveries in the shape of substitutes, whereby goods may be cheapened without deterioration. It takes an event in the trade of more than usual importance to bring about marked changes, and it may be that the advent of the automobile, and the resulting increase in the demand for rubber, will give just the additional impetus needed to the search for substitutes for rubber.

The ideal tire for the new vehicles has not yet appeared, so that new opportunities exist for inventors in the rubber trade. The new situation is, but another of the illustrations, all the time appearing, of the fact that the rubber industry has not yet reached its full development. It may be that the industry is yet to become more important, and yield greater profits to workers in it, than at any time in the past.

HOW TO START IN A RUBBER FACTORY.

A YOUNG man who is employed in a rubber factory writes to us for advice, stating that he is quite ambitious to learn all the details of the industry, and particularly the manipulation and compounding of rubber. It appears that the company by whom he is employed is disposed to give every opportunity to gratify his desires, and it has been suggested to him that a course in chemistry would be of great advantage. Meanwhile he writes to ask for some suggestions as to the best way in which to start to work up in the line of work he has chosen.

This letter is only one of many that have been received by THE INDIA RUBBER WORLD, covering almost the same line of thought. The predominant idea of those who are trying to help young men to positions of prominence in the line of rubber manufacture seems to be that they must, first of all, have a course in chemistry, and that then the whole rubber business will open up to them. It undoubtedly would be an excellent thing if every rubber manufacturer and every superintendent were an expert chemist. It is, however, more important that they be expert manipulators of rubber. If, after learning to compound and cure rubber, they were able to take a course in chemistry, the information then acquired would be infinitely more valuable than a course taken before such practical apprenticeship. If the young man in question really wishes to make himself valuable to the company for which he works, he has ample opportunity for learning right where he is.

Supposing the factory to be a mechanical goods concern, he should familiarize himself with the machinery, first of all. He should know how the washers, grinders, and calendars are set, how they are piped, the speeds at which they are run. As an additional means of education, he should take pains to find out what types of machines are used in other factories, and whether his company has the best equipment, and is up-to-date and aggressive in that line, or whether it is of the old fashioned conservative type. He should know how much work these mills can turn off,

and exactly how they are to be handled on all different stocks used in that mill. Then, in the handling of the crude gum, he has a long road before him if he would learn to be able to tell one grade of gum from another in its crude state, and after it is washed, and particularly to recognize it in vulcanized compound. Further than this, in all the scores of compounds that are made up, there are earths, metallic oxides, gums, oils, etc., with which he should familiarize himself. Again, there are the fabrics used in the making up of the goods. If he learns all that there is to be learned about drills, ducks, and sheetings, from the manufacturers' standpoint, he has gained information that is infinitely valuable to him and to his company, and that is sure to redound to his individual profit.

Briefly, then, instead of going out of the mill to learn something, let him stay right where he is, and gather in all the information in sight. If the day comes, as it is bound to, provided the younger man has average intelligence, when he knows more about the machinery, the gums used, when he is a greater expert on the ingredients that go to make up the compounds, and when he is the authority on the fabrics employed, his value will be fully appreciated, and the owners of the mill not only will not hold him down, but will utilize and pay for every bit of skill that he may be possessed of. The very fact that he is seeking knowledge, even if only a boy in the mill, will attract to him not only the best thought of the mill, but the attention and coöperation of the founders and owners, whose greatest problem is to get capable thinking men. Not only this, but the habit of observation and the stimulus to himself in his attempt to acquire this knowledge, will so broaden and help him that, before he knows it, narrow views, petty jealousies, the workman's suspicion of those in power, will fade away and he will find himself working with his employer for the interests of the concern, instead of working for him and for his day's pay. Chemistry is only one of many means to the end.

CURRENT SALES OF CAUCHOU at Antwerp are tenfold larger than at this season five years ago, while the rate of arrivals would indicate that the limit of development of the Congo field has by no means been reached. This rate of growth is larger than has been experienced in any other market, but it will have to be larger yet before the world can feel that it is comfortably supplied with rubber.

THERE IS A FEELING IN SOME QUARTERS that whenever somebody buys a little crude rubber at a decline in price, the cost of all rubber goods ought to come down. The fact is that the manufacturers of mechanical goods and of some other lines were too slow in putting up the prices of their products, on account of their hope that the high cost of raw material would be of shorter duration than proved to be the case. When they were forced, finally, to advance the prices of their goods, it was not always at a rate commensurate with the high cost of crude rubber. Hence they should not be expected to make more favorable discounts with every momentary decline in importers' prices. It may be added that very little rubber has changed hands at figures which indicated a decline; whenever buying has become more active the result has been to put up prices even higher than before.

THE LATE "BOOM" IN RUBBER SCRAP.

"WE are not likely again to see such prices paid for old rubber shoes as in March," said a prominent member of the trade, "for the reason that the late 'boom' was due to exceptional conditions. In the case of any commodity it is essential, for the sake of stability in prices, that there shall be somewhere a considerable surplus stock, upon which the trade can draw whenever, for any reason, there is a scarcity in current supplies. A surplus of 2000 tons of rubber scrap would operate as a balance wheel, so to speak, in preventing a marked advance in this commodity, particularly if it were under a single control. One reclaimer, having a surplus of this amount, by drawing upon it under certain conditions, instead of buying in the open market for his current needs, would thereby lessen the competition among buyers and thus check a tendency toward extreme prices.

"The fire at the Naugatuck reclaiming plant early in 1898 destroyed such an important surplus of scrap, besides leading to increased activity in buying by other parties, due to the increased demands which were made upon the outside reclaimers to supply the current requirements for 'shoddy' of the shoe factories of the United States Rubber Co. Not only was the number of active buyers increased, but the Naugatuck management began buying in order to accumulate a new surplus, in readiness for the plant which they have since built. Two further considerations were the unparalleled production of rubber shoes in the following season and the increased demand for 'shoddy' in the mechanical lines, due in part to the prevailing high cost of crude rubber and to the improved condition of business and consequent increased consumption. All these conditions culminated in the gradual advance in rubber scrap, until sales were made, in March, at 9½ cents.

"The decline since that time has been due to the beginning of the spring collections, and to the prospect that the volume of these will be very large, for the reason that so many rubber boots and shoes were sold last winter and also because the high prices realized for scrap has stimulated collections to an unusual extent. The market may be said now to be approaching normal conditions, one factor of which has been the accumulation of such a surplus as has already been referred to.

"It has been asked how high it is possible for rubber scrap prices to go without checking the use of reclaimed rubber. That limit has been reached already, provided the prices paid in March should become permanent. Then there would be a rush of manufacturers to the use of substitutes. The rubber industry is one in which changes are not made readily, on account of the great amount of experimenting necessary to change the compounds used. The high prices of scrap and of the resulting manufactured product were understood to be temporary, for which reason everybody involved preferred to pay more for the materials they were accustomed to use, rather than incur the expense of experimenting with something new. But there can be no doubt that, if old shoes were to remain above 6 cents, for carload lots, there would a wide use of substitutes in place of reclaimed rubber.

"The use of tire scrap has not become so large as might have been expected in view of the large amount of rubber that has gone into tires. The reason is that, on account of the want of uniformity in the quality of tires, as compared with shoe scrap, reclaimers have not yet been able to get so good results from them. A great quantity of old tires have been ground up by some of the tire manufacturers, without devulcanization, forming a powdery substance which has been mixed in compounding new tire stock. Rubber and fiber is ground to-

gether, in the case of 'hose pipe' tires, but this cannot be called reclaimed rubber. Solid rubber tires are also being ground up, this form of scrap presenting the same difficulties as bicycle tires when it comes to reclaiming.

"The difficulty in using imported rubber scrap is due to several reasons. Foreign rubber shoes are apt to be vulcanized harder than the goods made here, which adds to the expense of reclaiming rubber from them. Then the English scrap which come here contains a large percentage of tennis goods, which yield less rubber than rubber shoes, and this makes the price low. Continental shoes contain more rubber, but they are mostly lined with felt, which adds to the work of the reclaimers. The difference in European compounds, as compared with our own, also affects the result. Good reclaimed rubber can be obtained from foreign scrap, but it is a different sort of good stock from that to which our manufacturers are accustomed and is more costly to produce."

CONDITION OF THE BALATA MARKET.

THE output of Balata in Venezuela is on the increase, while that in the Guianas is declining. As an indication, the following comparison may be made of the total arrivals at Rotterdam for the past two years. Though the totals do not vary much for 1897 and 1898, but the percentage received from Venezuela in the latter year was more than double that of the former. The figures denote pounds:

	Surinam sheet.	Venezuela block.	Total.
Arrivals, 1897.	337,370	160,600	497,970
Arrivals, 1898.	168,960	349,360	518,320

The United States minister to Venezuela reports to his government that up to date Balata has been the main product from the lands of the Orinoco Co., Limited, an American corporation with \$30,000,000 capital, who have begun the development of Venezuela, having headquarters at Santa Catalina, on a tributary of the Orinoco.

The *Deutsche Gummi-Industrie* (Dresden) in its issue of March 20 printed this report from Rotterdam: "We would call your attention to the fact that the price of Balata, which has been very low for the past two years, threatens to rise to a very high point. The production in Surinam during the past season was, as is well known, materially lessened, and will be still more lessened during this season. Reliable reports inform us that the principal *concessionaires* have engaged only one-half of their former employes for this season, and that the smaller producers have been compelled to stop altogether, owing to unprofitable prices. The arrivals of sheet Balata [Surinam], which showed a decrease already in the past year, do not promise any increase for this year. The production of block Balata, on account of the favorable weather conditions in Venezuela during the last season, was very good; how it will fare in the present season and how it will be affected by prices, can at present not even be conjectured. The consumption of Balata, like that of India-rubber and Gutta-percha, is continually increasing; its cheapness and easy working qualities have in a great measure led to the invention of new compounds likely to create additional fields for its usefulness. Stocks are at present very small. As regular imports cannot be expected until the middle of April or the beginning of May, it would be advisable to secure the needs for the present season without delay."

TIRE DIAMETERS.—Tires of 1½-inch diameter still hold first place. The demand for the 1½-inch size is now a close second. The demand for 1¾-inch tires has increased considerably, but proportionately this size is not popular.—*The Wheel*.

MORE ABOUT RUBBERS IN THE SHOE JOBBING TRADE.

AT a meeting of Philadelphia shoe jobbers, on April 5, called with a view to coöperation with the new Middle States Shoe Jobbers' Association, of which mention was made in the last INDIA RUBBER WORLD, the attitude of the associations toward the rubber shoe situation was clearly defined. The occasion was an address by Mickle C. Paul, of Philadelphia, who is a member of the Middle States association and its vice president, although his own firm do not handle rubbers.

Thomas E. Greacen, a prominent New York jobber, as the story goes which was related by Mr. Paul, sent out a salesman on commission, who was not attached to the regular staff of the house, to sell Woonsocket rubber boots at the card price of \$2.49 a pair. The salesman met a retailer who wanted to buy at \$2.25. "I can get them at that price," said the retailer, and the salesman closed at \$2.25. When the order reached Mr. Greacen it was declined, and a letter was sent to the retailer stating that the salesman who had sold the boots at \$2.25 had disobeyed his instructions. Mr. Greacen kept a copy of this.

A salesman for another house called soon after on the same retailer.

"What do you ask for Woonsockets?" inquired the retailer.

"Why, \$2.49," was the response.

"Oh, I can get them for \$2.25."

"From whom?" asked the salesman, surprised.

"Greacen," was the response.

"You must be mistaken," replied the salesman. "Mr. Greacen belongs to the Middle States Shoe Jobbers' Association, is treasurer of it, and one of its express objects is to not make different prices for different dealers, but to have a uniform price and that the lowest at which rubber goods can be sold."

"But I have a duplicate of the order," persisted the retailer.

"Will you let me see it?"

There it was, in black and white—one of Mr. Greacen's order sheets, so many pairs of Woonsocket boots at \$2.25 a pair. The signature of his salesman was written below. "No reason to doubt the genuineness of the transaction?" added the retailer.

This salesman reported the matter to his house, it came to the notice of the Middle States Shoe Jobbers' Association, and in due time one of its officers—Mr. Daniel P. Morse or Mr. Irving R. Fisher—called upon M. Greacen. The latter was able speedily to explain that there had been no violation of his agreement with the association. He produced a copy of the letter in which he had declined to accept the retailer's order, and it raised him several pegs higher in the estimation of his visitor, all within a few minutes, and without any friction. Supposing Mr. Greacen had not been a member of the association, Mr. Fisher would not have had the temerity to broach the subject to him. But, being in a common interest, he felt the right that fraternity conveys of asking for an explanation.

William G. Grieb, of Philadelphia, secretary of the jobbers' association, explained the matter of regulating prices of rubbers:

"We have signed the contract of the United States Rubber Co. for years and frequently broken it," said Mr. Grieb, "feeling rightly that the company had no right to impose upon us the obligation of selling our own goods at prices dictated by them. We have always signed the contract simply because we could not get the goods otherwise. But the effect of evading its terms by selling below the price it stipulated has reacted upon all of us. For is it not true that Philadelphia jobbers

have been tumbling over one another in their efforts to get an order from a retailer? We hope to obviate this feature through the influence of this association by having it in the future settle on a uniform price."

"What's the difference between having the jobber's association settle on a price and the United States Rubber Co. doing it?" Mr. Grieb was asked.

"The rubber company sets the price, giving the jobbers no voice in the matter. The jobbers' association, on the other hand, will set a uniform price by agreeing among themselves, as honorable men, not to make different prices for different dealers."

"Will there be any exceptions in favor of a department store or other big retail buyer?" was the next question.

"While nothing definite was agreed upon in this connection at our meeting in New York recently, I think it was the sense of that meeting that there should be no discriminations."

To this Mr. Paul added that he had broached the same question at the last meeting in New York, and had found the sentiment very strong in favor of making no concessions to any retail buyer.

"What are we going to do with those who won't join the association and who cut prices on us and get all our rubber business?" asked one of the jobbers.

"A committee of our association will visit the executive board of the rubber company," answered Mr. Paul, "and ask that such jobbers thereafter be excluded from purchasing its goods." [The foregoing report is abstracted from *Shoe and Leather Facts* (Philadelphia).]

There are now four associations of jobbers—the Western, Eastern, Middle and Southern—and the suggestion is being considered that they unite in a national association.

No class appears to be benefited when price cutting in rubbers begins. The *Boston Transcript* quotes a member of the trade as saying: "The retailers are no better off than the wholesalers, because of the uncertainty which they feel constantly regarding prices. The consumer does not benefit, because the retailer usually gets the going price for his goods, even if he makes an extra 2 or 5 per cent. out of the jobber."

NOT ANTAGONISTIC TO THE JOBBERS.

ONE of the rubber shoe companies now offering to deal direct with the retailer advise THE INDIA RUBBER WORLD: "With regard to giving you our reasons in favor of selling rubbers direct to the retail trade, we prefer not to be quoted in the matter in any way. We will, however, say that it is simply a matter of business with us. If there is any profit in it for the jobber, we should be able to save that profit for ourselves, or divide it with the retailer. We believe the nearer the consumer and the manufacturer can be brought together, the better both interests will be served. We do not wish to be known as antagonistic to the jobbers. We have simply chosen this as our way; time will tell how successful we shall be in it."

HIGHER PRICES IN ENGLAND.

THE North British Rubber Co., Limited (Edinburgh), under date of April 1, issued a circular stating: "Owing to the still further advanced prices of crude rubber, since issue of our circular in January last, we now find it necessary to intimate another advance of 5 per cent., making a total of 15 per cent. in all, to take effect from and after this date."

SOME EXPERIMENTS IN MAKING RUBBER SUBSTITUTES.

SINCE India-rubber first became of value through vulcanization it has been the dream of experimenters and inventors to produce it artificially. One of the most persistent seekers after a substitute for the natural gum was the late Austin G. Day, who tried hundreds of experiments and took out many patents. He was in a measure successful, his "Kerite" compound proving of great value and being a result of his seeking for something that would wholly supplant rubber. As far back as 1866 he made public the results of some of his work, giving as formulas for rubber substitutes the following compounds:

No. 1.	No. 2.
Linseed oil..... 2 pounds.	Linseed oil..... 2 pounds.
Cottonseed oil..... 1 pound.	Cottonseed oil..... 1 pound.
Petroleum..... 2 pounds.	Petroleum..... 1 pound.
Raw turpentine..... 2 pounds.	Raw turpentine..... 2 pounds.
Sulphur..... 2 pounds.	Castor oil..... 1 pound.
[Boil 2 hours.]	Sulphur..... 2 pounds.
	[Boil ½ hour.]
No. 3.	No. 4.
Linseed oil..... 2 pounds.	Linseed oil..... 2 pounds.
Cottonseed oil..... 1 pound.	Cottonseed oil..... 1 pound.
Petroleum..... 1 pound.	Petroleum..... 2 pounds.
Raw turpentine..... ½ pound.	Raw turpentine..... ½ pound.
Liquid coal tar..... 3 pounds.	Liquid coal tar..... 2 pounds.
Peanut oil..... 1 pound.	Spirits turpentine..... 1 pound.
Spirits turpentine..... 1 pound.	Rubber..... ½ pound.
Sulphur..... 4 pounds.	Sulphur..... 2 pounds.
[Boil 35 minutes.]	[Boil 1 hour.]

In 1871 Mr. Day had brought his experimenting down to the following formula:

Cottonseed oil.....	14 pounds.
Linseed oil.....	14 pounds.
Asphaltum.....	8 pounds.
Coal tar.....	8 pounds.
Sulphur.....	10 pounds.
Camphor.....	½ pound.

In this the tar and asphaltum were first mixed with the cottonseed oil, after which was added the linseed oil and camphor, and, last of all, the sulphur, when the temperature was about 270° F.

A substitute designed to be used in rubber compounding in place say of reclaimed rubber was made as follows:—

Cottonseed oil.....	27 pounds.
Coal tar.....	30 pounds.
Earthy matter.....	5 pounds.

—to be mixed and heated to 300° F., and then strained and cooled to 200° F. Then were added 27 pounds linseed oil, the heat raised to 220° F., and 15 to 18 pounds of sulphur added, the heat being continually raised until the mass was sulphurized. When the heat reached 240° F. 1 to 1½ ounces of nitric acid was added, and at 270° to 280° F., from 1 to 3 ounces camphor was added to help the sulphurization. The resultant compound was used on the following basis:

Para rubber.....	20 pounds.
Litharge.....	5 pounds.
Sulphur.....	1 pound.
Above compound.....	20 to 40 pounds.

Mr. Day, however, did not insist on the compound quoted, but advised that the proportions be varied as widely as the exigencies of the case might demand. Whiting, barytes, infusorial earth, white lead, blacks—in fact, almost any of the oxides, carbonates, or earthy materials commonly used in compounding, were used in connection with his substitute, as also were any grades of crude rubber. Among other ingredients that

he found of use in making his substitutes were vegetable and animal waxes, together with ozocerite and paraffine. These, however, were only used in small quantities, and always in connection with the linseed and cottonseed oils, and generally asphaltum or coal tar. One of his compounds also called for a quantity of golden sulphuret of antimony, presumably to assist in the sulphurization and a small amount of tannic acid.

The record of Mr. Day's years of experimenting, unfortunately, is imperfect. Were it complete it would show that he drew upon almost all the ingredients then accessible, and that some of the results reached were very curious, and numbers of them of great value.

Another line of experimenting that is interesting, and that will yet produce good results, although so far it has not amounted to much, is in the use of cellulose. A very simple formula is of French origin and calls for the treating of cellulose with sulphuric acid, washing, drying, granulating, treating with resinate of soda—which is afterward precipitated by sulphate of alumina—then drying and molding under pressure. As a matter of fact the resultant mass would not be mistaken for rubber. An English formula is more like it. This consists of—

Cellulose.....	15 pounds.
Pitch.....	25 pounds.
Asphalt.....	20 pounds.
Silica.....	20 pounds.
Mastic.....	5 pounds.
Bitumen.....	5 pounds.
Resin.....	10 pounds.
Coal tar.....	12 pounds.

This makes a thick gummy varnish, which is of little use except as for its weatherproof qualities. Allen's formula for a cellulose substitute might have a value if it were carried further. It is made up of 100 pounds of resinous wood pulp treated with animal gelatine, 100 pounds asphalt, and 10 pounds asphalt oil, all heated and molded.

The Greening process, which is English, is more elaborate than Allen's, but seems a bit laborious and costly. This process calls for the treatment of the cellulose by a mixture of sulphuric acid and nitrate of potash, and, after drying, a treatment to a bath of liquid carbonic acid. When dry again, it is mixed in a retort with refined resin, gum benzoin, castor oil, and methylated alcohol. The distillate from this is dried by redistilling over anhydrous lime.

Another curious line of substitutes is that based upon the use of glue and glycerine. Some of these have uses, while others, that look very attractive, are of no use at all, for the simple reason that they will absorb water almost as readily as a dry sponge. The first of these is more than thirty years old and is said to be of French origin. The formula is:

Glue.....	4 pounds.
Glycerine.....	8 ounces.
Nut gall.....	3 ounces.
Acetic acid.....	1 pound in 5 pounds of water.

Ten years later this was approached by an English formula in which in place of the nut gall and acetic acid, chromic and tannic acids were substituted, and a modicum of ground cork was added as a cheapener probably. Some four years later an ingenious Prussian gave out a formula in which to the glue and glycerine and tannic acid were added Marseilles soap and linseed oil. None of the above have ever had a commercial

value, the nearest approach being the glue and glycerine compound used as a cover for gas tubing.

The substitutes that have really come into use generally are made either from linseed, cottonseed, or maize oils. Scores of these have been produced and thousands of dollars have been spent by promoters and owners in trying to make these gums do just what crude rubber will. A German formula that cost certain American investors thousands of dollars, and which for a time looked as if it was going to be generally adopted, was

Linseed oil.....	80 pounds	} in solution.
Lime hardened resin.....	50 pounds	
Sulphur.....	8 pounds	} add to above.
Linseed oil.....	42 pounds	

Add 20 pounds sulphur and heat to 375° F.

This gum, although used quite largely at one time in the United States, France, and Germany, is not manufactured now.

W. Lascelles-Scott, a distinguished English chemist, when on a visit to the United States to examine the Keely motor, called the attention of the writer to some very interesting formulas of his own for the manufacture of substitutes. For example, his soap substitutes certainly were original. They were:

No. 1.	No. 2.
Linseed oil.....28 pounds.	Aluminum soap.....15 pounds.
Sulphur.....8 pounds.	Almadina.....25 pounds.
Aluminum soap.....28 pounds.	Caoutchouc.....50 pounds.
Oil of turpentine.....4 pounds.	Sulphur.....6 pounds.
	Oleum succini.....4 pounds.

In others he mixed reclaimed rubber dust with hardened resin, and bitumen; also with precipitated cellulose. One of the most interesting was a compound of linseed oil, sulphur, mineral caoutchouc, and Russian petroleum. Whether or not any of these are in use it is impossible to state. There are, however, hundreds of tons of rubber substitutes sold and used annually. About one-half of what is used is made in the factories for private consumption. The other half is manufactured for the trade by supply houses. As a rule this is made of one of the three oils named above and may be generally divided into two grades: (1) the brown (or black) and (2) the white. The former is made by heating one of the fatty oils with sulphur; the latter is made by treating the oil cold with sulphur chloride. The substitutes on the market vary somewhat, of course, as they may be made from raw oil, or from "blown" oil, or it may be that the purchaser gets an oil that has been adulterated without his knowledge, which will make a difference in the product. As a rule, however, those who are furnishing the trade are giving a good article. At any rate, it is certain that more progress has been made in the direction of a good safe substitute in the last three years than in the twenty years preceding.

NOTE.—Among articles published hitherto in THE INDIA RUBBER WORLD which may be read with interest in connection with the above have been the following: "The Manufacture of Rubber Substitutes," April 10, 1897 (page 105.) "Rubber Substitutes and the Electrical Industry," September 10, 1897 (page 321).

IS THE CAUCHO TRADE IN PERU DECLINING?

By Fred J. Hessel.

MOST people connected with the crude rubber business will have heard of Dr. Antonio Vaca Díez's expedition, which started from Bordeaux toward the end of 1896 and proved such a disastrous failure.* The Doctor's original idea was to conduct his party, consisting of about 500 men and women, over the waterfalls of the Madeira river to his rubber estates in Bolivia, but subsequent events, and the hope of establishing a better connection between the Beni and the Atlantic, made him choose the longer, but apparently less dangerous, route up the Amazon through Peru, by way of the river Ucayali and its affluents, to the Mánú and Madre de Dios, which latter joins the Beni about twenty-five miles above the headquarters of Dr. Díez, called Orton.

During his last stay in London and Paris the Doctor succeeded in forming a private company *ad referendum*, and having been asked by the directors to go out and investigate the titles and value of the property, I joined the expedition in Pará and, journeying with it, gained an insight into the Caucho trade carried on along the route we traveled. According to my experience, comparatively few know exactly how this class of rubber, called also "Grossa" and "Peruvian," is collected and prepared. Hence it may interest the readers of THE INDIA RUBBER WORLD to learn something about it from one who has had an opportunity of studying the matter.

The way in which the Caucho business has been done in Iquitos for many years past is well known, and the statistics, compiled with much care by various firms of Pará, show how much of this article is brought down and exported to Europe and the United States in every year. It may, however, be as well to mention that, for reasons which I will try to explain, a falling off is sure to take place, if it has not already set in.†

The river Ucayali itself, through which we traveled slowly

and looking well about us, seems to be getting played out as regards the Caucho tree, and although some of its affluents will yield fair quantities yet, the shippers of Iquitos do not appear to be as busy as they have been; in fact, I understand from a letter received some time ago that the regular steamboat service, introduced about two years ago between that port and Pará, has already been suspended for want of freight. In some of the larger villages of the Ucayali, such as Nazareth, Contamáno, Masiséa, and Cumaria, we found plenty of people who would have been quite willing to follow us to Bolivia with a view to finding a wider and more remunerative field of labor. Of course, there may be plenty of Caucho trees yet, especially east of the Ucayali, in the vast and partly unexplored regions between the Javary and Jurúa, and around the upper Purús and Acre, but as the *Siphonia elastica*‡ is sure to exist there also, it will pay the gatherers better to go in for "fine Pará." Here, for instance, in the Beni and its affluents, I have come across many Caucho trees in the forests, but no one thinks of touching them as long as "Fine" is found in sufficient quantities for working.

The Tambo and the Urubamba rivers, which together form

* THE INDIA RUBBER WORLD has printed a number of articles in reference to Dr. Díez. In the issue of December 10, 1897, appeared a letter from Major J. Orton Kerby, who is also referred to by the present writer, narrating some particulars in connection with the death of Dr. Díez.—THE EDITOR.

† Some further information relating to this point appeared in an article on "The Peruvian Caucho Tree and its Product," in THE INDIA RUBBER WORLD for December 10, 1897 [pages 65-66], written with much care, though not by one who had visited the Caucho country in person.—THE EDITOR.

‡ The generic term *Siphonia* is now little applied to the South American rubber trees in America and the Europe, but the older designation of *Hevea*. The tree referred to here is referred to habitually in THE INDIA RUBBER WORLD as the *Hevea Brasiliensis*. Some points of interest in this connection appear in a lecture by Dr. J. Huber, of Pará, reported in our issue of January 10, 1898 [page 98].—THE EDITOR.

the Ucayali, were neither of them being worked when we passed, and during our thirteen days' canoe journey from the mouth of the Tambo up the Urubamba to Mishagua, we never saw a human being, or a hut. Don Carlos Fiscarrald, who opened up this part of Peru not very many years ago, and with whom I spent the last few days of his prematurely ended life, told me that some distance away from the river side Cacho was yet to be found, but too far away and not in sufficient quantity to make it pay.

In the Sepáua, an affluent of the Urubamba not much below Mishagua (or Puerto Fiscarrald, as it was renamed during my stay there), Mr. Fiscarrald's Piro Indians were then collecting Cacho in fair quantities, but it was dangerous work, as this river is infested by the savage tribe of the Amahuacas. Precisely while we were there, a party of about a dozen Piros arrived with two wounded. One of their men had been shot through the thigh and a woman through both breasts, the latter thus showing four wounds inflicted by one shot. According to the report given by these Piros—who, by the way, handle their Winchester with great skill—they had shot several of their assailants and put them to flight, but had thought it wise to retire, fearing that a larger party would soon be down upon them. The Amahuacas, like all the other savage Indians in these parts, have only bows and arrows to shoot with, but even these are dangerous weapons in an experienced hand. We were practising one day, to while away the time, and found it extremely difficult to hit the target, when I called a friendly Campa Indian who was looking on and asked him to show us what he could do. He grinned, took the bow, and without as much as aiming sent the seven-foot arrow straight into the very bull's eye from a distance of fully forty yards, for which feat, worthy of William Tell, I gave him a drop of liquor, much to his satisfaction. He gave me to understand that, at the same price, he would do it again, or a few times more, if I liked, but liquor was precious then, so I sent him about his business.

While in Mishagua, I made the acquaintance of Major J. Orton Kerbey, of Washington, who had come from Cuzco, also in connection with some rubber scheme, and got shipwrecked in the waterfalls of the Pongo de Mairique. A friend of mine picked him up near the mouth of the Huepaya, where he found him on a raft with two other young Americans, in an exhausted condition, having had nothing to eat for three or four days. Some letters which I have since received from Major Kerbey show that he is grateful for the little we were able to do for him then, of which I am glad. Precious little it was, for we, too, were on the brink of starvation; we also had suffered a shipwreck in the Urubamba and, Mr. Fiscarrald having been drowned, together with Dr. Vaca Díez, found it difficult to get assistance from the house of Suarez & Fiscarrald—the only one for hundreds of miles around—of which Mr. Fiscarrald was a partner.

But I am straying. From Mishagua we followed the course of the river of the same name for seven days in canoes and then turned into an affluent called Serjali (muddy river), reaching the narrow strip of high land (*varadero*) which divides the waters of the Ucayali from those of the Madre de Dios, about a week later. Along this route, and on the high plateau itself, I observed several Cacho trees, but they were few and far between, most of them yielding no milk worth having, which is but natural considering the height of the land above the level of the sea. There are, however, some yielding trees yet, and the representative of Suarez & Fiscarrald stationed there generally uses their milk, mixed with sulphur or gunpowder, to make waterproof tents and mackintoshes for the *caucheros* who pass through, to and from the Mánu.

From the other side of this hilly, marshy and about fifteen miles broad *varadero* the descent to the Mánu river is effected by the Cahspajali (sandy river) in about a day. At its confluence with the Mánu, the house of Suarez & Fiscarrald has another branch establishment, named Bella Vista, for the purpose of receiving and shipping the Cacho delivered by the collectors in the Mánu. There used to be another *varadero*, also opened up by Mr. Fiscarrald and his Piros, which connected the Camisea river with the Mánu, but since the Cacho in the upper Mánu has given out, the one by which we crossed was found shorter and more convenient.

According to the information which I was able to gather in the Mánu, the Cacho export from the river to Iquitos had, when the tree was still plentiful near the riverside, reached about 8000 arrobas (of 25 pounds Spanish) in one season, but as the tree is felled in order to get at its sap, the collectors had to go further and further inland, or higher up the affluents, and I do not think the last crop can have exceeded 4000 arrobas. It is not surprising, therefore, that the 400 workers, who were there when we passed, were considering the advisability of shifting down to the Madre de Dios, where not only the Cacho tree but also the *Siphonia elastica* are yet to be found in great numbers. Fear of the savages, with whom Mr. Fiscarrald had many a tussle in his exploring trips, and their indebtedness to the house of Suarez & Fiscarrald, had so far kept them in the Mánu, but since the beginning of the year, about half of them have come down to the Imambari, Carmen, and Sena, in Bolivian territory, and the remainder will no doubt follow soon, so that the Mishagua business, which depended on these people, will in all probability have to be liquidated, if not already done. The Peruvian Cacho export will suffer a reduction in consequence, as all the rubber gathered in the Madre de Dios and its lower tributaries will naturally be shipped by way of the Madeira and Acre—*i. e.*, through Bolivia.

Plenty of rubber of both descriptions is sure to exist in the lower Imambari, but the tappers can only advance slowly on account of the hostile Indian tribes. We ourselves were witnesses to various raids made on Peruvian settlers who had pushed on in front.

As to the manner in which the Cacho is collected, I have already mentioned that the tree is felled in order to secure its milk; that is to say, the sap is first extracted from the broad wings at its base by making vertical incisions of the V shape and placing receptacles underneath; then the tree is cut down just above the wings, which are generally from four to six feet high, and circular incisions are made round the fallen trunk, at a distance of about a yard from one another, up to the crown and the receptacles, or tubes of thick bamboo, placed under them on each side to catch the milk which oozes out from between the bark and the wood. The sap is then passed through a sieve, to free it from any bits of stick and bark, into a large basin, into which a rope, creeper, or strap has previously been placed, so as to be able to pull out the block of rubber after coagulation. The *caucheros* in the Mánu usually cut a hole in a fallen tree, 3×4 foot square, by 2×3 foot deep, for want of suitable basins. If the milk is then left to dry, covered with large leaves, it will take from ten to fifteen days to coagulate; if a small basin of soap lather is added, it will be ready in two or three days, and if mixed with the juice of a creeper called *vetilla*, diluted with tepid water and soap, six to ten hours will be found enough. The juice of the black *vetilla* is preferred to the white. When sufficiently coagulated, the square block is lifted out, and through its own weight flattens down into what is brought to market as Cacho, Grossa, or Peruvian Slab.

The so called Strips are the slabs cut in slices; this proceed-

ing is not resorted to by the *cauchero* himself, but by the shippers of Iquitos. The Caucho Ball, known here only by the name of "sernamby," consists of the bits of dried rubber string left in the incisions of the tree and collected about a fortnight after the tree has been bled. By sprinkling the fresh milk on a well cleaned piece of ground, the same bits of rubber string are obtained in about the same time and the whole is collected and rolled up in Ball, Roll, or Sausage.

The tree itself is from 50 to 90 feet high, has from three to five wings (*aletas*), coarse bark with small warts, bare stem of from two to four feet diameter, and at its crown thick egg-shaped leaves from five to eight inches long. Its roots, which yield no milk, run out a long way, and a good *cauchero* can, by their means, follow up a tree from a distance of 40 to 70 yards, which is worth something in a virgin forest. There are many similar trees, and it wants an experienced eye to discover the right specimen. They grow singly, often at great distances from each other, rarely in clusters of from ten to twenty trees, called *manchales*. The yield of a tree is from eight to twenty pints, according to size.

I have made a point of going through the process of the Caucho collecting myself and found it very rough work indeed, but in spite of that the *cauchero* generally does not wish to take to cutting "Fine," probably because he believes the old tale that the latter can, at times, only be done by going up to the waist into the water, an idea which is far from being correct. Here at least, in these parts, there is no such thing. Certain it is, however, that many of those who offered their services to me on the road, did so on condition that I should let them work Caucho, and not fine Pará.

In conclusion, and referring to what I said at the beginning, I would like to mention that out of the 500 people who left Europe as stated, only fourteen reached Orton in my company. Most of them stopped in Pará and Iquitos, and some in the Ucayali. The death rate was comparatively small, and after leaving Iquitos we had no fevers to speak of. The illnesses which, outside of a little intermittent fever, prevail in the Cauchero districts are chiefly anemia and dysentery, rheumatism and liver complaints coming next.

Orton, Bolivia, October 12, 1898.

THE EVOLUTION OF FIRE HOSE AND CIRCULAR HOSE WEAVING.—I.

By A Pioneer Loom Builder.

AMONG the exhibits at the World's Fair held in the Crystal Palace, in New York, in 1852, was a quantity of flat woven hempen hydraulic hose, then largely used for hand engine service in the European continental cities, as in fact it still is, to a great extent. The hose in service in our own country at that time was principally riveted leather, which, in order to render it pliable and serviceable, required frequent greasing, or "slushing." For this reason it was hated by all the old fire "vamps." It ruined their clothes, and spoiled their dispositions.

These were "the good old days" of volunteer service, when the "boys" ran with the "mercheen" and the many companies of the departments, on gala days and other festive occasions, preceded by platoons of police and numerous brass bands, were wont to turn out a thousand strong or more in showy uniforms, dragging their handsomely decorated "tubs," hose reels, etc., behind them in long procession, to the open-mouthed wonderment of the rustic, in town to see the sights.

This leather hose, though strong and durable, was inclined to be leaky and require frequent repairs. A Mr. Legal, at that time interested in the New York fire department, had his attention called to the hempen hose alluded to as a substitute for leather. He succeeded in 1856 in inducing Alfred Carson, chief engineer of the department, to give it a trial, and its use was continued under Chiefs Howard and Decker. It also found a ready sale in the fire departments of many other cities, by reason of its lightness and cleanliness. There were no rubber linings in these days, and this particular hose was short-lived, the objection being its rough interior and consequent loss of volume of water and decreased velocity of the same due to friction. It also frequently burst, though our engines seldom carried a heavy working pressure.

With a view to rendering the public independent of the imported article, Henry F. Herkener, in 1859, started the manufacture of flat seamless woven hose on a few hand looms, but used linen yarns instead of hemp. John Clark, of Malden, Mass., also had a similar factory. The New England Linen Hose Co. were also in the field. A similar hose was woven by the Fitchburg Duck Co., and, indeed, it is claimed that they

were the first in the field. This hose soon became popular for mill and factory purposes, and was also used to some extent on hand fire engines, steamers then having come into use in some of the larger cities. This hose was smoother and much more durable than the imported hemp, and did good service.

The heavy working pressure of the steamers soon began to call for an article which would stand from 200 to 400 pounds pressure per square inch. Four-ply rubber was used, but it was stiff and hard to handle. The principal objection, however, was to its high price, being at that time \$1.60 a foot.

About this time James Boyd's Sons, of Boston, manufactured at Lowell a heavy selvage edge duck hose, coating it on the inside with rubber, and riveting it lengthwise in the lap, as they had in the case of their leather hose, only the riveting in the case of the leather was spiral. This rubber coating was done by the Boston Belting Co. It was a bulky, clumsy article but nevertheless was much used in connection with the four-ply rubber, as the heavy working pressure of the steamers soon made short work of the now antiquated leather article.

No practical way had yet been devised or discovered for rubber lining the flat woven linen or hempen hose, although E. M. Chaffee, Charles McBurney, and James Bennett Forsyth were experimenting industriously with this end in view, and the latter ultimately succeeded. Cotton flat-woven hose was next manufactured and was rubber coated on the outside and turned inside out, so as to bring the rubber next to the water. This proved a failure, inasmuch as this operation increased the interior diameter, bringing the bursting strain to bear chiefly on the outside threads of the fabric, while those of the inner were slack, compressed, and forced out of their proper place.

Another way for getting a rubber coating inside of the fabric was by pouring rubber cement into the hose and drawing a metal cone back and forth through its length. This was then cured in a dry heater. The vulcanization, however, injured the linen, both the heat and sulphur fumes affecting the fiber. Mr. McBurney also patented a process by which a rubber tube was made, say $2\frac{1}{2}$ inches in diameter, then stretched on a $1\frac{1}{2}$ inch mandrel, put through the hose, the mandrel withdrawn, and

the rubber allowed to take its normal shape. This also was a failure. At this point it looked as if cotton or linen hose would have a very poor future, as no feasible scheme for lining it with rubber had been devised. Then came the Boyd rubber lined fabric, in which the section was made up flat like a belt, with the rubber coated on one side, then folded over lengthwise and riveted. This is believed to have been the invention of a Mr. Hunt, of Boston. While examining some of this hose in the office of Alexander Boyd in Philadelphia, James Bennett Forsyth, whose company made the rubber coating, conceived the idea of lining the hose after it was riveted, and did it so successfully within a day or two that Boyd countermanded all his orders for the flat process and began to have it done the new way. As the patent was to belong to the Boston Belting Co., Mr. Forsyth thought that they should pay the fees. John G. Tappen, the treasurer, however, refused to do so, so Mr. Forsyth assigned one half of the patent to John H. Cheever, who very gladly paid the fees.

Several parties then began to turn their attention to devising machines for making a circular seamless fabric, either a knit or a woven hose. Among them were James E. Gillespie, with Robert Cowen, of Cambridge, Mass., J. V. D. Reed, with B. L. Stowe, of New York, in the case of the weaving machines, and Mr. Sibley with Cornelius Callahan, of Chelsea, and Mr. Herkener, of New York, already alluded to, in the case of the knitting machines. As regards the latter, Mr. Sibley was the first to experiment. His so-called "stocking" fabric had no longitudinal threads and much resembled in appearance the leg of a stocking. In 1877 Mr. Callahan's patent came out. Mr. Herkener brought out his "Cable" brand in 1879 and his "Red Dot" in 1891.

In 1870 L. R. Blake, the inventor of the McKay shoe sewing machine, at the suggestion of his friend John Green, of New York, devised a machine for sewing up strips of rubber coated canvas with a double row of stitches, covering the seam on the inside with a strip of rubber, which was cemented as it was being sewed and drawn into the tube thus formed. At first only hose of small diameter was made, but shortly thereafter engine hose, and that of larger diameter for centrifugal pumps, etc., was manufactured. It was both cheap and smooth and durable; and an order was secured from the New York fire department for 2500 feet of $2\frac{1}{4}$ inch. But the stitched seams (which in reality were the strongest part of it) were looked upon with distrust, and it was but short lived like others of its class. Colonel Theodore A. Dodge had purchased these machines and was at this time manufacturing this "Blake hose" in a modest way in Cambridge. In 1872, while this hose was being manufactured, James E. Gillespie exhibited to the Colonel a set of drawings for a circular loom for weaving a multiple tubular fabric. The latter was not slow to "catch on"; the services of Mr. Gillespie were at once secured, and shortly thereafter a machine for this purpose was in process of construction. It was no small job, however. The machine was extremely intricate and embraced some 80,000 parts all told.

To assist Mr. Gillespie, Colonel Dodge in the following year engaged the services of Robert Cowen, a young machinist, but a man who, as it afterwards turned out, possessed a great deal of energy, perseverance, and no little amount of ingenuity. Mr. Gillespie soon dropped out, and the work was left entirely in the hands of Mr. Cowen as the mechanic, who ultimately succeeded in greatly simplifying the machine and who, later on, constructed an entirely new machine for weaving a single fabric. Their first venture with this latter machine was with small lawn or garden hose, which they manufactured exclusively for several years.

But to go back a little. In 1873 Colonel Dodge successfully tested before the fire commissioners in Boston the first length ever made of multiple cotton rubber lined circular woven fire hose made on the Gillespie-Cowen loom. This hose gradually fought its way to the front, but was finally abandoned by the company and the single fabric, or plain weave, manufactured in its stead.

The efforts and experiments of Colonel Dodge and Mr. Cowen covered a period of more than ten years, and the former, up to the year 1880, had spent \$150,000 in experimenting before the Boston Woven Hose Co. were fairly launched in business. In 1880 they employed but seven persons in their factory and occupied a floor space of only 3660 square feet. In 1896 they employed 975 persons and occupied a floor space of 247,530 square feet, Mr. Cowen then being superintendent of the factory and vice-president of the company.

[TO BE CONCLUDED NEXT MONTH.]

WHERE OUR RUBBER EXPORTS GO.

THE exports from the port of New York during the four weeks ended March 28, classed as "India-rubber goods," amounted in value and were consigned to different countries as follows:

Great Britain.....	\$28,933	San Domingo.....	36
France.....	3,430	British Guiana.....	170
Germany.....	13,323	Brazil.....	217
Austria-Hungary.....	1,446	Argentina.....	341
Belgium.....	1,713	Ecuador.....	40
Holland.....	551	Colombia.....	447
Italy.....	349	Peru.....	10
Spain.....	42	Chili.....	201
Denmark.....	155	Venezuela.....	241
Norway.....	241	Australia.....	5 187
Russia.....	189	New Zealand.....	162
Switzerland.....	427	Tasmania.....	21
Azores.....	4	British East Indies.....	238
Mexico.....	1,965	British Africa.....	4,548
Central America.....	665	Other Africa.....	728
Cuba.....	2,873	British North America...	594
Porto Rico.....	183	Total.....	\$60,073
British West Indies.....	366	Total for February.....	42,902
Haiti.....	37		

The value of such goods exported from New York amounts usually to something less than 60 per cent. of the total for the United States. These statistics do not embrace dress shields, which were exported from New York during the same four weeks in March to the value of \$25,837, or clothes wringers, to the value of \$24,996, or such rubber goods as may have been embraced in exports classed as electrical material, bicycle material, dental material, and the like. It is probable, too, that some rubber may have been included in the exports classed as: Belting, \$5447; hose, \$2310; packing, \$2232; and valves, \$6766. There is further to be considered the large number of tires, the value of which is included in the exports of bicycles. Crude India-rubber was shipped from New York to the value of \$22,027 and rubber scrap valued at \$15,508. The exports of "India-rubber goods" to Cuba are shown in the table above; other exports to that country were: Belting, \$910; packing, \$633; hose, \$871. One item reported by the custom house is "rubber machinery," for Hanover, valued at \$150.

The total exports of rubber boots and shoes from the United States have been as follows:

	Pairs.	Value.
Eight months from July 1, 1896.....	234,116	\$146,592
Eight months from July 1, 1897.....	330,214	184,440
Eight months from July 1, 1898.....	362,008	188,674

Total exports of reclaimed rubber for the first eight months of the current fiscal year amount to \$213,469, against \$172,778 for the corresponding period one year ago.

ANSWERS TO CORRESPONDENTS.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Has there appeared in your columns an article on the waterproofing of duck, such as is done on tarpaulins, or can you give us any information as to how it is done? We enclose a sample that we have proofed experimentally, but are not quite satisfied with it. We should like also to know of some compound that would render phosphate bags impervious to water. These bags, standing as they do in the open field, gather moisture, which generates an acid in the phosphate, the result being that the fabric quickly perishes.

THE sample enclosed is apparently a rather high cost rubber solution and would hardly be available for the purpose desired. The English are probably the largest manufacturers of waterproofed tarpaulins in the world. Some of their compounds have a little rubber in them, but most of them have not, and the latter answer the purpose excellently; for example, a Brattice Cloth compound, which is supposed to resist either alkaline or acid waters, such as may be found in mines, is made of 2 pounds of purified white paraffine wax, $1\frac{1}{2}$ pounds cotton oil, $\frac{1}{4}$ pound resin, and $\frac{1}{4}$ pound oil of turpentine. Another is made of equal parts of Cativo gum and India-rubber, mixed with whiting, white lead, litharge, and sulphur. Still another is 200 gallons of linseed oil, 5 pounds manganese, 10 pounds red lead, and 12 pounds umber, mixed together, to which is added 25 pounds sugar of lead and 5 pounds white vitriol. Boil and let stand for 12 hours; then combine one gallon of the above mixture with 5 pounds raw linseed oil. Colors may be added as desired. Other compounds are made of tar, tallow, rosin, sulphur, and potash. Unless a manufacturer is fitted up for this work, if he is going to use a rubber compound, it is cheaper to get the canvas proofed by some company making a business of that kind of work, or, if the manufacturer has a spreading machine, rather than put in churns and mix his own compounds, he had better buy some of the excellent compounds now on the market, such as Ruberine, for example.—THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: I am making an experimental model in which I am using several pieces of hard rubber in sheets $1/64$ inch thick and I wish to cement several thicknesses together without increasing the total thickness of the several pieces of rubber, if possible. I tried shellac in ammonia, but it did not dissolve. Can you give me information on this matter?

AN old-fashioned formula for uniting metals, hard rubber, etc., that can be used very thin, is 45 ounces of Gutta-percha, 20 ounces shellac, 5 ounces gum mastic, $\frac{1}{2}$ ounce oxide of lead, 3 ounces styrax, $26\frac{1}{4}$ ounces of Venice turpentine. A simpler cement, of French origin, is 2 parts Gutta-percha, 4 parts India-rubber, 1 part fish glue, 26 parts bisulphide of carbon. If the sheets of rubber are perfectly smooth, it might be well to roughen them up a bit before cementing. If you happen to be near a rubber factory and can do so conveniently after roughening the sheets, coat them with cement (1 pound Pará rubber to $\frac{1}{2}$ pound sulphur) and have the sheets put in a press and vulcanized together.—THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Is rubber or Gutta-percha used in the manufacture of what is known as feather-fur?

FEATHERFUR, or what has been known as artificial sealskin, was formerly manufactured in Europe, the backing being cloth and the feathers being set by combs in a cement solution spread

on the cloth. Whether this is in use at the present time, it is impossible to say.—THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Can you give me a good formula for a rubber stamp ink?

INKS for rubber stamps, as a rule, are prepared with glycerine for a base, aniline colors that are soluble in water, and water. What is said to be a very good one, consists of 70 parts of glycerine, 10 parts alcohol, 10 parts of pyroligneous acid, 10 parts of distilled water, 3 parts aniline blue, 1° B. The ingredients to be triturated. The blue is rubbed down in water and the glycerine gradually added, the other ingredients being added when solution is effected.—THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: In some rubber work that I am doing, I find that I can use a little fish glue, but I want to keep it from absorbing water. Can you tell me how to do this?

ADD 2 per cent. of bichromate of potash and the resultant compound will be very nearly waterproof.—THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Can you tell me the use of sublimed white lead in rubber manufacture?

LEAD is used partly as a filler and makeweight, but chiefly because it produces a very resilient rubber. The sublimed lead is used in part because it is so free from grit and impurities.—THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: I want to know if there is a rubber that will not contaminate wine if immersed in it?

A PARÁ compound cheapened by some absolutely inert material, such as infusorial earth or flour of glass, with only enough sulphur in it to effect a cure, would not harm the wine, particularly if the rubber were thoroughly desulphurized by boiling in a solution of caustic potash and afterward deodorized by a treatment with animal charcoal. All of this costs money, however, and the ordinary wine tubing is sold at a price that will not warrant it.—THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: I am desirous of securing all the works on the general subject of India-rubber that may be in print. Kindly furnish me with a list of the same.

TWO recent important works are the Cantor lectures on India-rubber, by Dr. D. Morris, and the Cantor lectures on Gutta-percha, by the late Dr. Eugene Obach. Both of these were so thoroughly reviewed in THE INDIA RUBBER WORLD that a good idea of the valuable information contained in them was available for readers of the paper. If the inquirer is familiar with French we would refer him to a very interesting work, "Le Caoutchouc et la Gutta-percha," by E. Chapel, Paris. It might also be well for the inquirer to scan the announcement of the new book, "Crude Rubber and Compounding Ingredients," which appears in this issue of THE INDIA RUBBER WORLD.—THE EDITOR.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Do you know of a rubber gum called lithosite, and where can I get a sample?

THERE is no point of similarity between rubber and lithosite. The latter is made of oxide of magnesium, chloride of magnesium, boracic acid, and oxalic acid. It is largely used for underground conduit pipes, for electrical work, for car roofing, etc.—THE EDITOR.

INDIA-RUBBER INDUSTRY ABROAD.

CANADA IMPORTS MORE RUBBER GOODS.

THE value of imports of manufactures of India-rubber and Gutta-percha into Canada during the fiscal year ended June 30, 1898, is officially stated to have been:

IMPORTS.	United States.	Other Countries.	Total Value.	Duties Collected.
Boots and shoes.....	\$ 34,246	\$ 21	\$ 34,267	\$8,566.80
Belting	19,859	1,295	21,154	4,238.18
Clothing and waterproof cloth.....	35,320	110,006	145,326	46,155.61
Hose.....	21,258	175	21,433	7,499.41
Packing and mats.....	19,001	105	19,106	6,682.21
Sheeting.....	346	346	86.50
All other.....	125,495	36,104	161,599	39,459.70
Total.....	\$255,525	\$147,706	\$403,231	\$112,688.41
Total, 1897.....	209,776	110,127	313,903
Total, 1896.....	217,536	139,745	357,281

There may also be noted the following imports, not classified by the customs as rubber goods:

IMPORTS.	United States.	Other Countries.	Total Value.	Duties Collected.
Elastic, round or flat...	\$13,917	\$54,964	\$68,881	\$21,794.34
Webbing, elastic or non-elastic.....	73,581	56,888	130,469	24,763.18
Stockinette for rubber boot and shoe makers.	38,455	11,687	50,142	7,381.96
Duck for rubber belting and hose.....	85,134	4,553	89,687	free.
Rubber thread, elastic..	870	870	free.

The exports of Canadian rubber manufactures were larger than in any former year, as follows:

To—	Value.	To—	Value.
Great Britain.....	\$12,790	Turkey.....	10
Newfoundland.....	12,335	United States.....	44,947
Australia.....	7,586		
France and colonies....	17	Total.....	\$77,685

Total exports, 1896-97..... \$26,121

Total exports, 1895-96..... 30,879

This journal published on December 1, 1898, details of the imports of crude India-rubber into Canada for the last fiscal year, indicating a larger consumption than in any former period.

THE INDUSTRY IN GERMANY.

THE Hanoversche Aktien-Gummiwaaren-Fabrik, at their twelfth annual meeting, on March 7, voted to declare a 12 per cent. dividend, against 10 per cent. last year. New additions to the factory will be completed by July 1, and another prosperous year is predicted. A sixth member was added to the board of directors—Counsellor Dr. Siegmund Meyer I.

The Vereinigte Hanfschlauch- und Gummiwaaren Fabriken (Gotha) report for last year a profit of 174,400 marks, against 168,700 marks for the preceding year. A dividend of 8 per cent. was declared—the same as for 1897. The dividend for 1896 was 12½ per cent. The business so far in 1899 has been better than last year, the factories being fully employed. The inability of manufacturers to advance their prices to a degree corresponding with the high cost of crude rubber is referred to as having had an unfavorable effect on their balance sheet.

The Gummiwaaren-Fabrik, Voight & Winde, Aktien-Gesellschaft (Berlin), report net profits of 72,736 marks, against 66,196 marks on the business of 1897. The dividend is 6½ per cent. against 6 per cent. last year. The factory was kept busy, with a larger volume of production. A good business is predicted this year.

The Continental Caoutchouc and Gutta-Percha Co. (Hanover, Germany) earned a 55 per cent. dividend last year, besides liberal amounts being written off and fees for directors. The company have a reserve fund of \$600,000. The original share price has been paid in dividends several times over, besides which the reserve funds are more than the original capital.

THE ENGLISH RUBBER ASSOCIATION.

MOST of the leading rubber manufacturers are said to have become members of the new organization in the trade, of which the articles of association follow:

"I. That the India-rubber manufacturers of the United Kingdom form themselves into an association, the objects of which shall be to promote the common interests of the trade; especially with reference to legislation, and to difficulties in the general conduct of the business.

"II. That the association be called the India-Rubber Manufacturers' Association.

"III. That members shall consist exclusively of firms possessing India-rubber works."

F. B. Knott, No. 2 Cooper street, Manchester, England, is secretary of the association.

FIFTY YEARS OF SUCCESS.

THE fiftieth anniversary of R. & J. Dick, India-rubber and Gutta-percha manufacturers at Glasgow, Scotland, was celebrated recently in a public hall, over 600 persons taking part. An address was presented to Mr. James Dick, the surviving member of the firm, by the workmen who had been employed for twenty years or more, some of them having been employed for forty eight years. It was stated that the firm had made, for a period of over twenty-five years, an average of more than 20,000 pairs of boots and shoes a week, and they were now making shoes for horses, besides a large amount of Gutta-percha and Balata canvas belting. Their shoes, by the way, are made of leather, with Gutta-percha soles. The company were among the earliest users of Gutta-percha, and they are today the leading consumers of Balata in Europe. Mr. R. Dick died in 1891, since which time his brother has conducted the business alone. The Greenhead works during fifty years have paid £2,000,000 in wages, and the number of their employes has averaged 800 or more.

The Continental Caoutchouc and Gutta-percha Co. (Hanover) recently celebrated their silver jubilee—being the twenty-fifth anniversary of the firm and also of Manager A. Prinzhorn's connection with the firm. They give regular employment to 1600 hands.

BRITISH RUBBER NOTES.

AN article on the shoe house of John Rye & Co., No. 46 Aldersgate street, E. C., London, in the *British Journal of Commerce*, refers to their agency for Great Britain and the continent for the Woonsocket Rubber Co. It is mentioned that a feature of their trade has been the construction of a line of models known as the "Rye" lasts, "the goods from which are specially adapted to British feet and fittings."

J. Mandleburg & Co., Limited, waterproof manufacturers at Pendleton, Manchester, England, report net profits of £27,785 on their business for 1898, allowing of a 10 per cent. dividend on the ordinary shares, after paying interest on debentures and dividends on preferred shares, and carrying forward £9160. It is stated that the result of the business so far in 1899 has been even more satisfactory than for the same time last year.

RECENT TRADE PUBLICATIONS.

GENERAL CATALOGUE OF MECHANICAL RUBBER GOODS. THE Manhattan Rubber Manufacturing Co., New York. [Paper. $5\frac{1}{2}'' \times 7\frac{1}{4}''$. 270 pp.]

THIS is a really imposing looking volume, containing not only a very full list of products in the mechanical rubber line, but fuller information in regard to the various articles than is usual in such catalogues. A new feature is the numbering of the illustrations, of which there are 370, to assist persons writing by mail with regard to goods in indicating the articles referred to. The catalogue embraces, in addition to the standard mechanical goods, concentrator belts, horseshoe pads, billiard table cushions, tennis soling, weather strips, plumbers' supplies, sheet tiling, printers' blankets, emery wheels, and a wide range of other goods.

A special department is devoted to miscellaneous information, including some matter not contained in other catalogues in the trade. Such is a "discount table," showing the net cost of an article at any of the various lines of discounts allowed on rubber goods; a "schedule showing advance of 10 per cent. on goods sold at a discount"; equivalents of inches in millimeters, etc. There are also measurements to be considered in ordering belting and other mechanical goods.

The editor of this catalogue is the company's secretary, Mr. E. M. Henderson, who is to be congratulated upon having made in a trade publication so good a contribution to the literature of India-rubber. The Manhattan company have issued lately attractive little catalogues, devoted respectively to—

- "Rubber Tiling," 24 pp.
- "Steam Packings," 32 pp.
- "Fire Hose and Fire Department Supplies," 32 pp.
- "Mats and Matting," 32 pp.
- "Garden Hose," 24 pp.

[CATALOGUE] 1899. THE BOOMER & BOSCHERT PRESS CO., SYRACUSE, N. Y. [Paper. $5\frac{1}{2}'' \times 8\frac{3}{4}''$.]

A VERY complete list of steam and hydraulic presses, including some types which have met with satisfactory use in the leading rubber factories in the country.

MECHANICAL RUBBER GOODS. HOME RUBBER CO., TRENTON, N. J. [Paper. $4\frac{3}{4}'' \times 7\frac{1}{4}''$. 144 pp.]

A FULL line of mechanical goods, together with cotton hose, carriage cloths, bicycle tires, etc., produced by one of the largest and most complete plants in the country, which are briefly described, with the aid of good illustrations, followed by prices. There are notes on crude India-rubber and the other materials used in the industry, and information regarding processes of manufacture and their bearing upon the quality of the product. A good index adds to the completeness of the catalogue, which is also very attractive as a piece of bookmaking.

"EVERYTHING IN RUBBER GOODS." C. J. BAILEY & CO., BOSTON, Mass. [Paper. $3\frac{3}{4}'' \times 7\frac{1}{4}''$. 78 pp.]

AN illustrated and descriptive price list of an exceptionally wide range of goods—embracing particularly everything in rubber production except the heavier mechanical goods.

CATALOGUE NO. 17. BICYCLE SUPPLIES. THE NATIONAL CEMENT and Rubber Manufacturing Co., Toledo, Ohio. [Paper. $4\frac{3}{4}'' \times 6\frac{3}{4}''$. 36 pp.]

INCLUDES rubber cements, liquid tire cements, hard cements, lubricators, enamels, polish, tire tape, repair kits, and an extensive line of vulcanizers and vulcanizing supplies, some of which will be described later in this journal.

RUBBER COVERED CARRIAGE STEPS. MANUFACTURED BY THE Rubber Step Manufacturing Co., Exeter, N. H. [Thick paper. $5\frac{1}{4}'' \times 6\frac{3}{4}''$. 24 pp.]

THIS business has extended until thirty-two illustrations are necessary in describing the various styles and designs of rubber pads for carriage steps. The company control American, English, Canadian, French, and Belgian patents, the first issue dating from June 11, 1867. Their goods are used by many carriage builders abroad. Attention is called to the great reduction in prices this season.

[CATALOGUE] 1899. JENKINS BROTHERS, NEW YORK. [INCLUDING Products of the Jenkins Rubber Co., Elizabeth, N. J.] [Paper. $7\frac{1}{2}'' \times 5''$. 69 pp.]

THE principal products of this important concern are the "Jenkins Bros. valves," the "Jenkins discs" for valves, and the "Jenkins standard packing." Their valves cover a very wide range. The "Jenkins disc" is composed of a hard rubber compound which, when worn out, is easily replaced at a slight expense. Should scale or grit get between the disc and seat, it does not injure the metal, but imbeds itself in the softer material; by replacing the disc the valve is as good as new. The "Jenkins '96 packing," for steam joints, is in wide use. The company also make rubber pump valves.

CATALOGUES RECEIVED.

LATTA & MULCONROY, Philadelphia=[Catalogue of] Mackintoshes, Water Bottles, Syringes, etc. 8 pp.

William Yerdon, Fort Plain, N. Y.=Yerdon's Improved Double Hose Band. Folder.



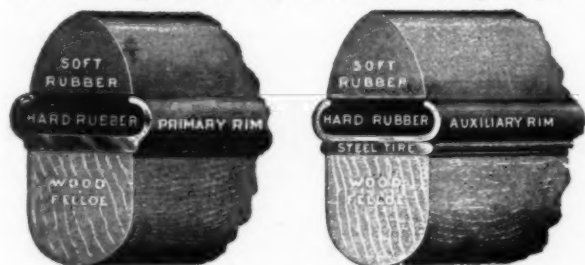
Favori. Princesse. Serge. Surcouf. Mercedes. Léda. Redingote empire.

FRENCH STYLES IN WATERPROOF GARMENTS FOR WOMEN.
[From the announcements of A. MAUREL & FILS, Paris.]

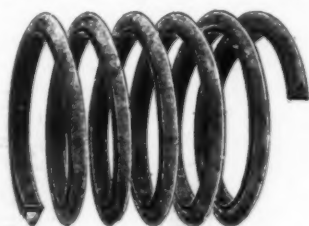
A FEW NOVELTIES IN RUBBER TIRES.

HARD AND SOFT RUBBER VEHICLE TIRES.

A NEW solid rubber vehicle tire consists of hard and soft rubber, compressed into a primary steel rim from which it can be detached. The rims are of the "clinker" pattern, and made of cold rolled steel. They have a thickened base, to insure strength and rigidity, and curved or beaded edges, extending slightly over the felloe, to act as a protection to the latter and impart to the wheel an attractive and finished appearance. The duplex rubber cushions comprise a base of hard rubber having projecting edges or lips and a tread portion or wearing surface of soft stock, the two being firmly vul-



canized under heavy pressure. The term "hard rubber" is used here to denote a much harder stock than is used on the tread of the tire, and which possesses practically no elasticity. This construction has been adopted with the idea that the base



will be so tough and strong that, once sprung under the curved edges of the steel rim, it will, without the aid of cement, remain seated in spite of any strain that can be applied to a tire. The soft rubber portion, lying entirely above the rim, cannot cut against its edges when acting under the weight of the vehicle. With a view to increasing the power of this tire to resist abrasion, and its wearing qualities and resiliency, an original method of compressing the tread has been adopted. The tire is vulcanized in a spiral form, which better adapts it to use when conformed to the periphery of the wheel than if vulcanized in straight lengths. The inner diameter of the spiral is about seven inches for a strip which, when stretched out straight, is fourteen feet long. In expanding these small circles to the diameter of the wheel there would be little effect upon the rubber if it was all soft, but since the base of the tire is hard and incapable of stretching, the adjustment to the changed relation of the diameters falls altogether on the soft tread stock, with the result, as claimed, that fully 10 per cent. more material is crowded into the tread than could be put there if the strip were molded straight. The first step in compressing the rubber tire within the rim is shown by Fig. 1, whereby one edge of the hard rub-

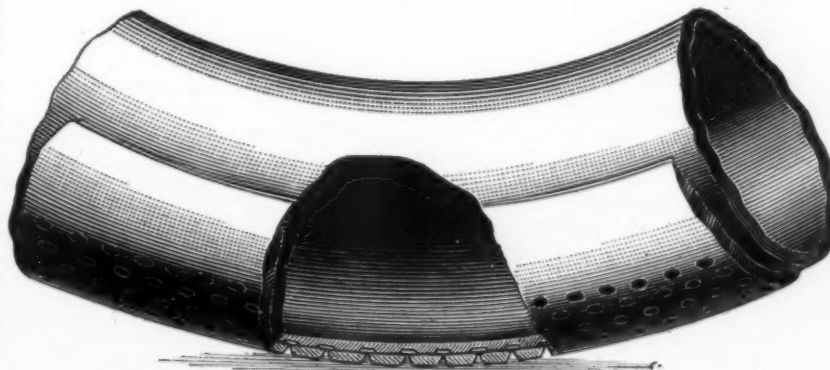
ber is put under the rim, and the tongs applied as in Fig. 2. The pressure given to the hard rubber base by the tongs forces it into the concave position shown in No. 2, and allows the outside edge to clear the curve of the rim, slip under the edge and assume a position illustrated in Fig. 3. Each squeeze of the tongs will force about 1 1/4 inches of the rubber tire into place. On account of the



fact that the rubber strips are put into the rims sidewise with this tool, it is possible, in case of a bad cut or injury, to remove a short section of the rubber and slip a new piece of the same length into its place. The rims are made in two styles, as shown in accompanying illustrations. No. 1, or the "Primary" rim, intended for new work, is furnished to carriage builders ready for welding. No. 2, or the "Auxiliary" rim, is designed to be attached to finished vehicles, either old or new, without removing the steel tires already on the wheel. Manufactured by the Peoria Rubber and Manufacturing Co., Peoria, Ill.

A TREAD FOR PNEUMATIC TIRES.

THE new rubber tire brought out by the Metallic Rubber Tire Co. (New York), the incorporation of which was reported in the last INDIA RUBBER WORLD, is more properly described, perhaps, as a tire tread. The object is to prevent slipping and to lessen liability to puncture. The tire with protruding spikes is well known, but it has been complained that they increase the labor of propulsion, or that they break off, or else become clogged with mud. One other trouble with these is the fact



TIRE TREAD ARMORED WITH RIVET HEADS.

that, as the spikes are held by rivets, which in turn are covered with washers on the inside, these latter soon wear out the fabric of the tire. In this new tread the inventor uses a soft vul-

canized strip, studded with flat-headed rivets, driven from the inside and clinched on and against the outside of the yielding fabric of the tread, so as to slightly draw in and depress the fabric immediately around the clinched outer ends. These rivets then form hard, biting heads, level with or just inside the normal bearing surface of the tread. In this way the rubber in the tread comes in full contact with the road, while, on account of the weight of the rider, the rivets also take hold and make a durable bearing surface and absolutely prevent slipping on any kind of road or pavement. These treads can be securely cemented to any tire, and are so put on that they cover the bottom and side bearing surface of the tire. This tread can also be placed around an inner tube and laced on the inside, or these rivet heads may be placed on the outer tube of a double-tubed tire. The rivets are really double-headed and clinched on the outside, which prevents their moving about in the fabric.

At a meeting of incorporators of the Metallic Rubber Tire Co. held in Jersey City, N. J., in March, Calvin T. Adams was elected president; Frank M. Burger, secretary and treasurer; and J. J. Deppler, general manager. The principal office is at No. 21 East Twenty-eighth street, New York, and the office in Jersey City at No. 243 Washington street.

THE COLLINS PNEUMATIC HUB WHEEL.

THIS is a pneumatic wheel without a pneumatic tire—designed for bicycles and for sulkies and other vehicles. It em-



PNEUMATIC HUB.



POSITION OF SPOKES.



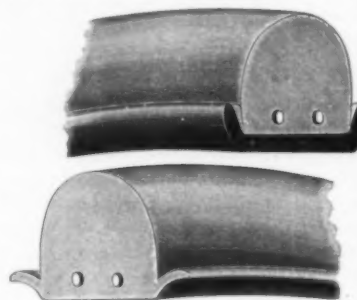
THE TIRE.

braces a pneumatic tire or cushion around the hub, where it forms a resilient cushion, taking up the road vibration through frame and handle bar, where it is safe from punctures and cuts. The inner hub, of steel, is mounted on ball bearings. Surrounding this hub are steel-aluminum cones, termed the thimble, which carry the pneumatic hub tube. An aluminum tube, called a drum, surrounds the pneumatic tube, and to this are attached the spokes. One of the illustrations herewith represents the pneumatic hub, with its inflating valve, and another the arrangement of the spokes. A third illustration shows the form and method of application of the rubber tire used on the wheel rim. These tires can neither puncture nor slip off. Manufactured by the Collins Pneumatic Hub and Wheel Works, Sayre, Pa.

THE WING TIRE FOR VEHICLES.

THE illustrations herewith represent a new feature in the construction of solid rubber vehicle tires for which a patent has been granted lately. On account of the shape of the new feature the name "wing" tire has been adopted. Among the advantages is that, by molding the tire with stiff rubber wings extending outwardly, the tendency of these wings, when pressed in the channel, is to expand against the metal flanges at all times, thus preventing the entrance of dirt and water. By the

insertion of the wing between the channel and the main body of the rubber tire, the channel may be filled tighter with rubber



THE WING TIRE.

without running any risk of cutting on the edge, which is referred to as preventing creeping. It is also claimed for the new tire that it presents a neater appearance than any other vehicle tire. The manufacturers offer a tire machine for applying the rubber direct to the channel, which may be bought by carriage builders for use in their factories. Manufactured by the Goodyear Tire and Rubber Co. (Akron, Ohio), a new corporation regarding which some particulars were given in THE INDIA RUBBER WORLD of January 1.

CHICLE AND CHEWING GUM.

ON the exportation of chewing gum manufactured by the American Chemical Co. (Philadelphia), from imported Chicle and sugar, the government has allowed a drawback equal to the duties paid on the imported materials used, less 1 per cent. "The quantity of gum Chicle and sugar used in the manufacture of such chewing gum shall not exceed the following allowances: On each and every 100 pounds of chewing gum, 49.7 per cent. of sugar and 26.3 per cent. of gum Chicle."

There have been several reports lately respecting a consolidation of chewing gum manufacturers in the United States, with a capitalization of \$15,000,000, but it is not known that anything has been accomplished. Some of the concerns are the Adams & Sons Co., Brooklyn; The Beeman Chemical Co., Cleveland; W. J. White & Sons, Cleveland; J. P. Primley, Chicago; S. T. Britten, Toronto; and The Kis-Me Gum Co., Louisville. The annual production of chewing gum is estimated at \$6,000,000.

The imports of Chicle into the United States for the first eight months of the fiscal year beginning July 1, 1898, amounted to 1,362,870 pounds, valued at \$204,185. The duty is 10 cents per pound.

Chicle is admitted duty free into Canada, where 86,844 pounds were imported during the last fiscal year.

AGENCY WANTED IN ENGLAND.

TO THE EDITOR OF THE INDIA RUBBER WORLD: We are agents for several good English hardware firms and are anxious to increase our business. Can you introduce us to a first-class American firm of general rubber manufacturers? We have a very extensive and sound connection among buyers of rubber goods on this side.

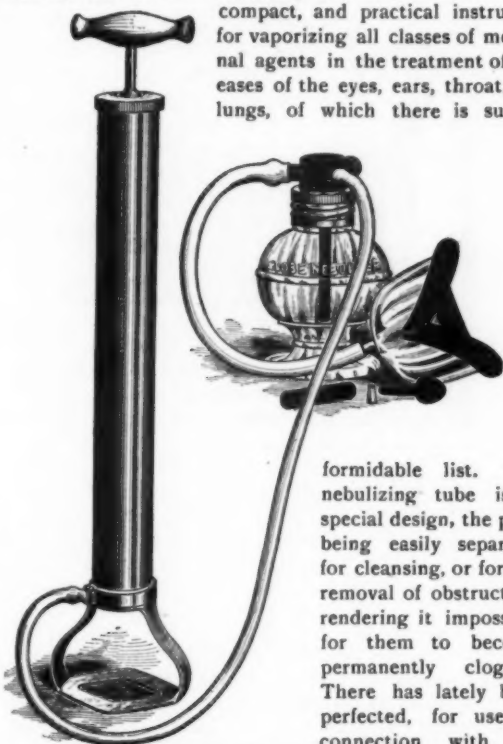
[ANSWERS to this notice, sent in care of THE INDIA RUBBER WORLD, will be forwarded promptly.]

BOOK ON RUBBER PLANTING.—Under the title "Life in the Tropics," some facts in regard to the planting of India-rubber, cacao, coffee, bananas, cocoanuts, and pineapples have been compiled by Mr. William S. Armstrong, who has an interest in a rubber plantation at Bluefields, Nicaragua. Copies can be had for thirty cents, postpaid, from Mr. Armstrong, whose present address is Natalbany, La.

NEW GOODS AND SPECIALTIES IN RUBBER.

THE "GLOBE" NEBULIZER.

THIS nebulizer is intended primarily for use in physicians' offices, but is also prescribed for home treatment, and may be operated either in connection with an air-compressing outfit or by hand. It was designed by Dr. H. M. Dunlap, with a view to supplying the demand for a simple, compact, and practical instrument for vaporizing all classes of medicinal agents in the treatment of diseases of the eyes, ears, throat, and lungs, of which there is such a



formidable list. The nebulizing tube is of special design, the parts being easily separable for cleansing, or for the removal of obstruction, rendering it impossible for them to become permanently clogged. There has lately been perfected, for use in connection with the

nebulizer, a detachable pneumatic cushion for the inhaling mask. There is also shown in the cut a portable hand pump, designed to take the place of the ordinary rubber hand bulb used with atomizers and nebulizers, furnishing a much larger volume of air at higher pressure and with less effort. This has aluminum stirrup, base, and cup; ball valves at both inlet and outlet; and is nickel plated and highly finished. The price, of pump and nebulizer combined, with five feet of rubber tubing, is \$6.50. The nebulizer alone is sold for \$5. There is also made the "Universal" atomizer, on the same general principles, at \$2.50. Made by The Globe Manufacturing Co., Battle Creek, Mich.

NEW METHOD OF MARKING TIRES.

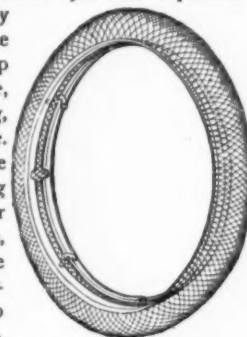
This cut represents a mode of marking tires on the under side, opposite the valve stem, which may be found of great service to the dealer. Many times an unguaranteed tire is required to be sold with a guarantee for one, two, or three months. Heretofore this has involved difficulties with regard to determining when the term of the guarantee began or ended. When this improvement is used, if one wishes to sell a



tire in March, for instance, and guarantee it for sixty days, the figure "3" is erased—this representing the month in which the tire is sold—and also the figure "5," which represents May, the month in which the guarantee expires. The "G" is to be erased in case the tire carries no guarantee. The figures may be erased readily by cutting them off with a knife. This feature is embodied in all the tires sold by The Straus Tire Co., No. 127 Duane street, New York.

THE "AMERICAN" PUNCTURE LOCATOR.

SINCE practically no pneumatic tire is puncture proof—unless, it may be, at the expense of resiliency—it is expected that cyclists will be interested in any method by which a puncture may be located unerringly. By means of the "American" puncture locator either a continuous or lop end inner tube of a pneumatic tire, after being removed from the casing, can be inflated to riding pressure. After the removal of the inner tube it is inflated slightly before being placed in the "locator." The locator is then locked secured with hooks, allowing the valve to protrude through a hole provided for the purpose. The tube is then inflated to ordinary riding pressure and immersed in water, when the exact location of the puncture can be determined. Manufactured by The American Puncture Locator Co., Nos. 84-86 La Salle street, Chicago, Ill.



THE "SOROSIS" CUSHION HEEL.

THIS is a new article, which has been brought out by an experienced firm of rubber manufacturers for a leading house in the leather and shoe trade. Some of the heels already in the market are referred to as being too soft and spongy, and it has been attempted to avoid these qualities in the "Soros." Another point which is made in describing these heels is that they will retain their color—black—which is a very desirable consideration. The small nail holes are further pointed to as an item to commend these heels. The rubber firm who are manufacturing these goods advise THE INDIA RUBBER WORLD that their sale is increasing very rapidly. The trade is supplied by Mulford, Cary & Conklin, No. 34 Spruce street, New York.



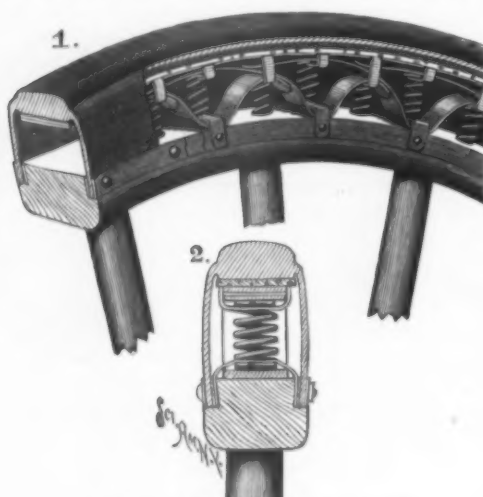
A NEW USE FOR RUBBER PACKING.

THE plan for sending mail matter and other parcels by pneumatic pressure under the streets of our cities—a plan, by the way, which is expected to have a great future—has brought out a new use for rubber. The carriers in which the matter is placed are cartridge-shaped receptacles a little over two feet long and six inches in diameter. To insure a perfectly tight fit these are encircled with four strips of rubber packing. Each of these strips is made up of forty-five plies of cotton duck, frictioned with a good grade of rubber compound, pressed up into a slab, and cut so that the surface for wear comes on the

cut edge. It is estimated that within a year or two \$15,000 or \$20,000 worth of this packing will be used annually.

RAMSEY'S NOVEL CUSHION TIRE.

A CUSHION tire invented by O. Ramsey of El Campo, Texas, is composed of a series of coiled springs and a series of plate springs, both so arranged between the tread and the rim that they can be easily removed and others substituted, without the necessity of removing the tire from the rim. On the rim there are secured by straps, a series of plate springs curved to form divergent arms of unequal lengths. The plate springs are so arranged that the outer end of the long arm of one spring shall overlap the outer end of the short arm of the second spring in advance. Two sets of coiled springs are arranged around the rim and disposed in alternate series. One set is secured to the points where the plate springs are bent and fastened to the rim.



[By courtesy of the *Scientific American*.]

The other set is secured to the points where the arms of the plate springs overlap. The tire consists of a covering of rubber thickened at its middle or tread portion. Beneath the tread of the tire a strip of cork is secured, which is designed to prevent the moisture, which might possibly penetrate the tread of the tire, from corroding the springs. The edges of the tire are seated in rabbets upon flat packing rings of rubber, likewise designed to prevent the entrance of moisture. To secure the tire to the rim, flat spring-metal bands through which bolts are passed are employed. The bands are made in sections to permit the removal of any segment, should it become necessary to repair a broken spring. Tires thus made may be used on bicycles and other vehicles. Should one of the springs become broken, the tire will not collapse, but will still be retained in position by the remaining springs.

THE SANITARY RUBBER RING.

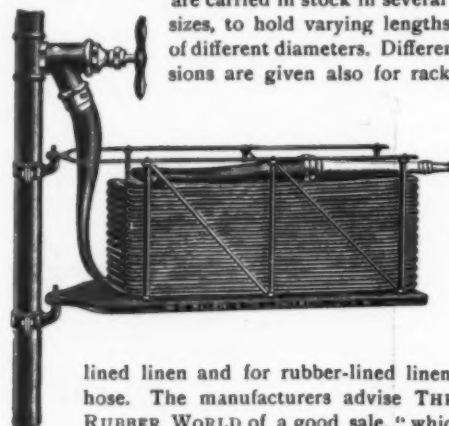
THIS article is designed for use on the covers of toilet vessels and slop jars, to prevent the escape of offensive odors, and also to prevent noise when removing or replacing covers. It likewise affords protection against breaking. It is easily removed to allow the cover, or the ring itself, to be washed. These rings are made in several diameters, to fit different sizes of covers, although their elasticity enables them to be fitted to covers of varying diameters. In ordering, the approximate diameters of



the covers should be mentioned. They are sent, postpaid, for 25 cents, with special terms to agents. Made by the Sanitary Ring Co. (W. W. Mead, superintendent), No. 181 Tremont street, Boston.

THE "DEWEY" HOSE RACK.

THIS rack is constructed with a view to its possessing great strength, while taking up less room than many others in the market. The advantages of hose racks are too well known to need argument. The "Dewey" rack is furnished with pipe clamps or clamps for wall brackets, as may be desired. They are carried in stock in several different sizes, to hold varying lengths of hose of different diameters. Different dimensions are given also for racks for un-



lined linen and for rubber-lined linen or mill hose. The manufacturers advise THE INDIA RUBBER WORLD of a good sale, "which would seem to indicate that there has been a demand for just such a rack. One thing noticeable about it is that it is finished in aluminum. We finish them all in aluminum paint about the same as Uncle Sam uses for his letter boxes. We believe whatever Uncle Sam does is all right, and it is particularly fitting that the Dewey rack should be finished Uncle Sam's way." Manufactured by W. D. Allen & Co., No. 151 Lake street, Chicago.

THE STERLING INFANT'S BATHTUB.

THE latest and apparently the best achievement in bathtubs of the type shown in the illustration is the "Sterling." It is



made of extra heavy white rubber drill, of the best quality. It is certainly a great step in advance over the old-fashioned tin tub. When open the tub is 36 inches long by 16 inches wide, and when closed it is four inches wide. The frame is made of stout cherry and white wood, the whole being neatly and artistically finished. A set of pockets for sponge and towel is attached to one end of the tub, while the hard rubber outlet and tube is conveniently placed at the lowest end of the pouch. The bathtub can be easily folded in a canvas case and carried anywhere. Manufactured by the Sterling Rubber Co., Boston.

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BRIEF ABSTRACTS OF RECENT RUBBER PATENTS.

AMONG recent patents issued by the United States patent office, embodying applications of India-rubber or Gutta-percha to a greater or lesser extent, have been the following. It is not practical here to do more than to note the use of rubber sufficiently to enable those who may feel interested to decide whether or not to look into any particular patent more fully:

TIRES.

No. 619,871.—Vehicle Tire. Julius Czepull, Lancaster, Pa.

A vehicle-tire comprising an elastic or flexible tube, a filling for the tube, consisting of a mixture of glue and about two per cent. of alcohol.

No. 620,252.—Pneumatic Tire and Rim for Cycle or Other Wheels. Edward E. Preston, and Charles E. Gibson, Leicester, England.

A pneumatic tire and rim comprising a cover and its lining angular concaved-faced bands either in sections or completing the circle, studs or buttons fixed to their under sides to engage with recesses through angular-shaped beadings formed within the rim upon the inflation and expansion of the air-tube placed within the cover a channel formed in the bottom of the rim to enable one of the angular concaved bands to be pushed from off its seating and the studs from their fastenings upon the deflation of the air tube.

No. 620,507.—Pneumatic Tire for Cycles. William H. Sewell, Port Stewart, Ireland.

A wheel comprising a tubular rim, a yielding tube within the rim, and a pneumatic segment formed with a hollow chamber, with a thickened side wall, with a yielding apex or tread, thinner than the side wall, and with a yielding inner wall bearing against the yielding tube.

No. 616,497.—Tool for Loosening Inner Tubes of Bicycle Tires. William H. Phelps and John F. Brenner, Quincy, Ill.

A tool for detaching the inner or air tube from the outer tube of a double tubed bicycle tire, consisting of a metal rod having one end bent into circular form forming a ring at an angle to the rod and the extremity bent backward and soldered to the rod, the ring being of a size sufficient to permit the passage there through of the inner tube of a bicycle tire.

No. 617,595.—Tire Horatio B. Hollifield, Sandersville, Ga.

The combination with the spring-wire tire-tube having the sets of integrally-formed small-coils of the spring-metal hoops lying, respectively, in the sets, and the cover enveloping the tube.

No. 618,072.—Inner Tube for Pneumatic. James H. Driscoll, Rouse's Point, N. Y.

In combination, the inner segmental tubes, the outer tube formed with orifices and integral flap provided with orifice, the crescent shaped plate formed with a threaded stud-bolt and adapted to be inserted within the outer tube and allow the bolt to project outwardly through the orifices in the flap, and the counter-part plate formed with orifice to receive the bolt, and with the short studs to engage the first orifices in the outer wire, and the nut secured on the stud-bolt.

No. 618,073.—Clamp for Inserting Tubes in Pneumatic Tires. James H. Driscoll, Rouse's Point, N. Y.

An inner-tube carrier comprising a flexible handle, a spring-actuated clamping-tongue fixed to one end of the handle. And means for confining and releasing the free end of the tongue.

No. 618,395.—Pneumatic Wheel-Tire. George H. Clarke, Boston.

In a pneumatic wheel tire, an air-tube, a substantially impermeable jacket in which it is inclosed, a cellular or porous tread-

strip at the tread side of the inclosed air tube, and an outer covering, the parts being attached together.

No. 618,691.—Composition for Closing Punctures in Pneumatic Tires. Antoine Lavocat, Lyons, France.

The herein-described composition of matter, consisting of Gutta-percha, a balsam, bird-lime, turpentine, a saturated solution of celluloid, and a suitable solvent.

No. 618,755.—Pneumatic Tires. Arrah J. Whisler, Kokomo, Ind. Filed August 19, 1898. Serial No. 687,441. (No model.)

An improved tire comprising an inner layer of rubber, an outer layer of rubber and a layer of fabric intermediate the inner and outer layers, the fabric being extended at one edge beyond the outer layer and at its other edge beyond the inner layer of rubber whereby when the tire is formed the extended edge of fabric will overlap and may be secured together.

No. 618,903.—Pneumatic-Tire Protector. William Stoffel, McHenry, Ill. Assignor of one-fourth to Nickolaus A. Hemen, same place.

The pneumatic-tire protector herein described consisting of the endless belt composed of the layers, of gradually-decreasing width and each formed by folding the edges over to the centre of the main body of the layer, the whole being rigidly secured together.

N. 616,163.—Non-Slipping Pneumatic Tire. Henry E. Walter, London, England.

A pneumatic tire having around its circumference and on either side of it a series of sharp-edged disks or wheels at intervals apart one from another to more or less cut into the ground and prevent sidewise slip.

No. 616,182.—Pneumatic or other Elastic Tire. Lestock W. Cockburn, Hamilton, Canada.

A band or strip of waxed canvas or similar material adapted to be readily applied and caused to adhere to the side of a pneumatic or other tire.

No. 621,240.—Pneumatic-Tired Wheel for Vehicles. Rudolf Freysinger, Sassenhof, Russia. Filed September 1, 1898. Serial No. 690,016. (No model.)

No. 621,370.—Pneumatic Device for Bicycles or Vehicles. James W. Perry, Shamokin, Pa. Filed October 5, 1898. Serial No. 692,688. (No model.)

No. 622,060.—Pneumatic Tire. James A. Murphy and Amos D. Rowe, Holyoke, Mass., assignors of one-third to Charles H. Morgan, same place. Filed July 20, 1898. Serial No. 686,429. (No model.)

No. 621,451.—Tire for Bicycles. William L. Foote, New York city. Filed May 6, 1898. Serial No. 679,887. (No model.)

No. 621,504.—Cushion Tire. Ole M. J. Ramsey, Ellinger, Texas. Filed February 25, 1898. Serial No. 671,800. (No model.)

No. 621,971.—Pneumatic Tire. Charles G. Page, Oak Park, Ill. Filed October 22, 1897. Serial No. 656,020. (No model.)

No. 620,695.—Machine for Vulcanizing Bicycle Tires. Frank R. Chamberlain, Newton, Mass., assignor to the Newton Rubber Works, same place. Filed December 17, 1898. Serial No. 699,560.

No. 620,698.—Combined Metal and Rubber Vehicle Tire. James Christy, Jr., Akron, and Harry E. Randall, Dayton, Ohio. Filed October 18, 1898. Serial No. 693,593.

No. 620,705.—Bicycle-Tire Armor. Emil H. Haupt, New York city. Filed September 30, 1898. Serial No. 692,821. (No model.)

No. 620,754.—Pneumatic Tire. Brisbane Doyle, London, England. Filed January 18, 1898. Serial No. 667,097.

No. 620,779.—Pneumatic Tire. William Howard, London, England. Filed June 18, 1898. Serial No. 683,826.

No. 620,985.—Tire. Charles Squier, and Francis Windham, London, England. Filed August 7, 1897. Serial No. 647,472.

MECHANICAL.

No. 619,745.—Horseshoe. William S. Hitch, Dover, Del.

A horseshoe composed of an upper plate having its bottom side provided with a series of recesses, elastic pads inserted in the recesses of the upper plate, a lower detachable shoe-plate, an intermediate rubber plate or pad, and means for connecting the plates.

No. 620,286.—Rubber Roll. George F. Dodge, Great Neck, N. Y.

A rubber roll composed of the inner thick core of cheap rub-

ber compound adapted to tightly embrace a spindle, a thin outer cylindrical coating or layer of tough rubber, and an intermediate layer of cellular or sponge rubber nearer the periphery than the center of the roll and all vulcanized together.

No. 620,821.—Hose-coupling. Charles C. Abbey and William C. Phillips, Redlands, Cal. Filed October 9, 1897. Serial No. 634,711.

No. 620,878.—Cushioned Horseshoe. Herman E. Bauer, Marshfield, Wis. Filed September 19, 1898. Serial No. 691,233. (No model.)

No. 620,917.—Apparatus for Testing Drains, etc. William H. Hammond, Wakefield, England. Filed October 22, 1898. Serial No. 694,275.

No. 621,000.—Elastic Tread Horseshoe. William R. Howe, Dayton, Ohio. Filed May 28, 1898. Serial No. 681,457.

No. 621,398.—Tread for Stairs. William H. Winslow, Chicago. Filed March 14, 1898. Serial No. 673,708. (No model.)

MISCELLANEOUS.

No. 619,275.—Fruit-Jar Holder. Thomas F. Byron, Des Moines, Iowa.

A fruit-jar holder, comprising in combination, a handle having a straight outer edge, a rubber strip on the outer edge, a series of pins or screws in the handle, a single piece of flexible wire having a central portion passed through the handle and then extended outwardly and again through the handle near its straight edge, then formed into two loops to encircle the jar and finally passed through the handle from its opposite side at a point some distance from the straight edge, and having its ends connected together, and a block attached to the loops, and a rubber face for said block.

No. 619,873.—Means for Excluding Air from Tins, Bottles, Jars, and Other Receptacles. Alfred Dunhill, London, England.

In combination with a bottle having a ridge or groove, a stopper, a rubber or like sleeve, and a band for securing it to the outside of the bottle, the sleeve extending over the rib or groove and over the joint of the cap and adapted when rolled back to be held by the rib or groove.

No. 619,984.—Facing for Garments. Alfred L. McLaughlin, Paterson, N. J.

A skirt-facing comprising two layers of suitable material secured together by an adhesive, one of the layers comprising a series of bias-cut pieces of silk, and the other of the layers being a reinforce therefor and comprising a series of bias-cut pieces of stiff material reversely disposed to those of first named layer, and a cord stitched along the edge of the facing.

No. 621,907.—Hand Stamp Handle. Granville W. Duncklee, Brookton, Mass. Filed January 7, 1898. Serial No. 531,064. (No model.)

No. 622,040.—Coachman's Hat. Herman Falkenbach, New York city. Filed January 27, 1898. Serial No. 609,128. (No model.)

No. 620,664.—Elastic Band.—Louis Nassim, London, England. Filed April 15, 1898. Serial No. 677,701.

No. 620,680.—Rain-Apron for Vehicles. Jacob A. Sommers, Hamilton, Ohio. Filed October 24, 1898. Serial No. 694,467.

No. 621,384.—Boot or Shoe Heel. George H. Swenson, Everett, Mass. Filed March 15, 1898. Serial No. 673,940. (No model.)

No. 622,137.—Shoe-Inflator. Leon Fitzjarrell, Baltimore, Md. Filed June 27, 1898. Serial No. 684,575. (No model.)

No. 621,000.—Manufacture of Rubber and Other Gums. Edmond Garnier, London, England, assignor of three-fourths to Anthony Raymond, same place. Filed October 22, 1898. Serial No. 691,297.

TRADE MARKS.

No. 31,565.—Manufactured Rubber Goods. The Victor Rubber Tire Co., Springfield, Ohio. Filed February 2, 1899.

Essential feature—a representation of an arrow-head. Used since December 1, 1898.

No. 33,581.—Bicycle Cements. Benjamin Nusbaum, Philadelphia. Filed September 22, 1898.

Essential feature—the words "Red Seal" and the representation of a red disk-shaped figure having points radiating therefrom simulating a legal seal. Used since August 1, 1898.

DESIGN PATENTS.

No. 30,378.—Golf Ball.—James Foulis and David Foulis, Wheaton, Ill. Filed January 30, 1899. Serial No. 703,900. Term of patent seven years.

No. 30,416.—Tire for Wheels. Frederick W. Huestis, Boston, Mass. Filed February 21, 1899. Serial No. 706,730. Term of patent fourteen years.

No. 30,417.—Elastic Vehicle-Tire. George E. Dryden, Chicago. Filed March 2, 1899. Serial No. 707,533. Term of patent seven years.

No. 30,425.—Chair-leg tip. Frank Watt, Marquette, Mich. Filed March 1, 1899. Serial No. 707,405. Term of patent seven years.

No. 30,432.—Water-Bottle. Charles A. Tatum, New York city. Filed February 27, 1899. Serial No. 707,118. Term of patent seven years.

No. 30,433.—Water-bottle. Charles A. Tatum, New York city. Filed February 27, 1899. Serial No. 707,119. Term of patent seven years.

SOME WANTS OF THE RUBBER TRADE.

THE following inquiries come to THE INDIA RUBBER WORLD from patrons. We shall be pleased to be able to place them in communication with parties able to supply their wants. Correspondence in regard to these inquiries should refer to them by number. No expense is involved in this service, which is for the benefit of our readers.

[17] "Will you kindly give us the address of parties who sell Gutta-percha sheet?"

[18] A rubber manufacturer in Germany writes asking who manufacture goods labeled:

K. W. & CO.
ALASKA.
N. Y.

[19] "Can you put me in communication with the manufacturers of 'Fenton's artificial India-rubber?'" [The address has been supplied, by mail.]

[20] "We are looking for an electrical thermometer, or an apparatus that will communicate from a vulcanizing room, to another room two stories away, the temperature of the first room."

[21] "Can you give us the name of a manufacturer of a good wire grip machine for wire winding hose?"

[22] "Can you inform me who manufactures an electric or power knife for mackintosh cutting?"

[23] "Who handles the Hancock masticator in this country?"

[24] "We have quite a business in the manufacture of double texture overgaiters and leggings. In the past we have purchased from certain rubber manufacturers remnants of coated cloth that we could use in this business. We are in the market for quite a quantity of them."

[25] "Will you kindly give us the address of a party who manufactures an attachment for a calender for measuring sheeting?"

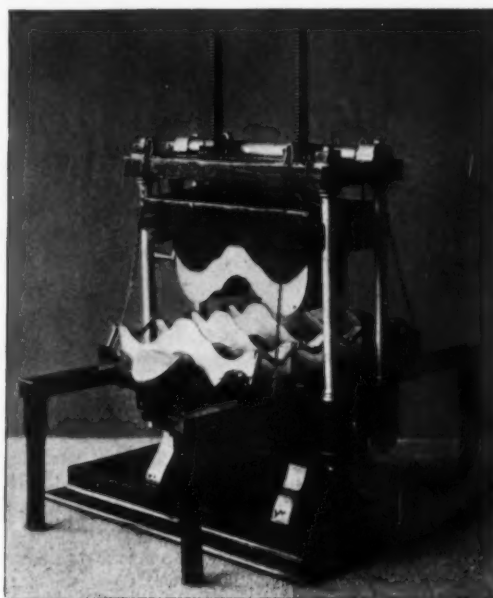
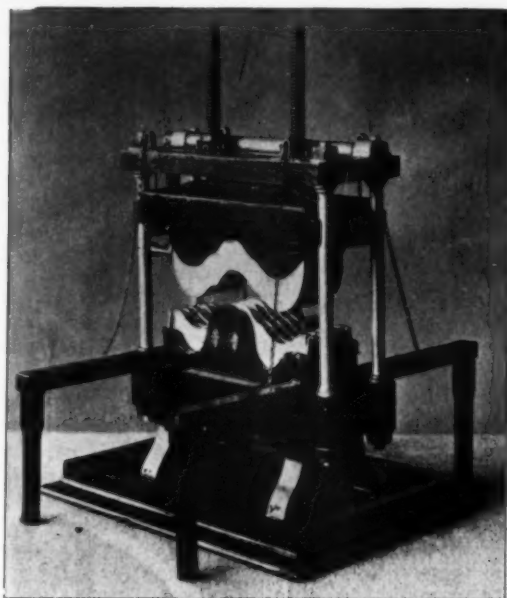
ANSWERS.

[13] A. ADAMSON (Akron, Ohio) advises us that he has the very best facilities for making molds for rubber work, making his own castings, and using the finest chilled iron for molds. —R. W. Rhoades & Co., proprietors of the Rubber Stopple Co. (Long Island City, L. I.), state that they are prepared to furnish molds, as well as molded rubber goods. —William Eggers, No. 292 Graham street, Brooklyn, N. Y., invites correspondence on the same subject.

[14] Frank Venn, P. O. box 1627, Malden, Mass., writes: "I sell the best ink there is in the market for marking the widths and sizes on rubber boots and shoes."

[15] Montgomery Brothers, No. 48 North Front street, Philadelphia, write: "We are extensive manufacturers of rubber cements, and if your correspondent will advise us the kind of vulcanized rubber he desires to cement, we may be of assistance to him." —C. H. Orgelman, Box 359, Bristol, R. I., writes that he may be able to direct our correspondent where he can supply his wants in rubber cements.

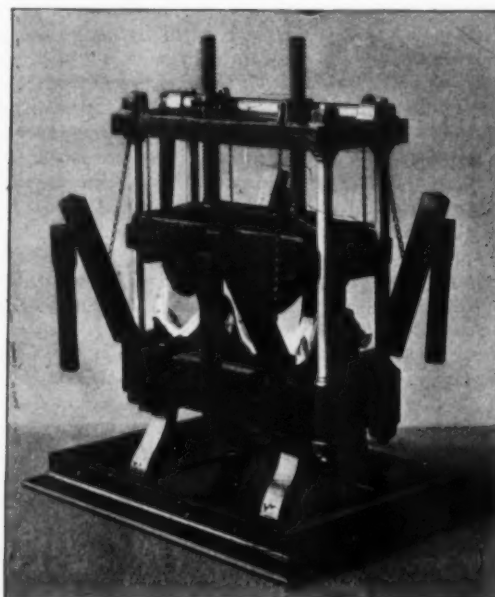
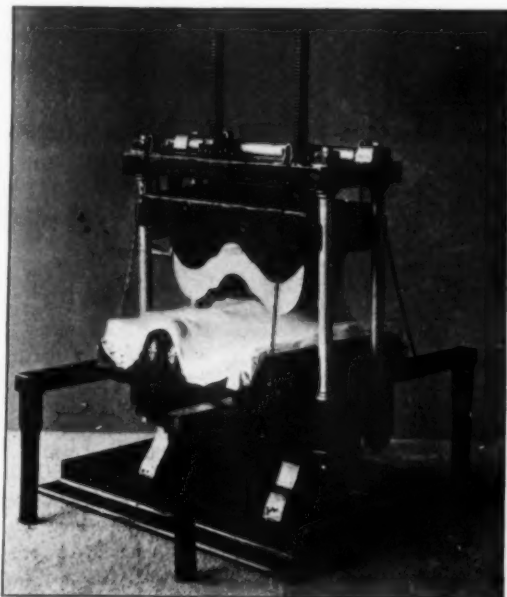
[16] Joseph Bachrach, No. 162 Powers street, Brooklyn, N. Y., is open for correspondence with regard to the manufacture of rubber toy balloons.



THE MULTIPLE STOCKINET DRESS SHIELD MACHINE.

THE manufacture of stockinet dress shields is a business that is in but a few hands and one of which little is known by the trade at large. The stock, which is a fine grade of gum, compounded so that it has not only entirely lost the smell of the rubber, but has in addition, a faint cleanly perfume, is carefully calendered upon the stockinet. The old fashioned way was to make the goods up with a seam under the arm. Modern mechanical ingenuity, however, has devised a number of machines, that, taking advantage of the stretch in the fabric as well as the rubber, press the sheets into shape and vulcanize them while they are held in position. There are a variety of these machines, but the best perhaps is the latest one devised by Mr. A. C. Squires, who is well known as a dress shield expert. The illustrations herewith show a

model of this machine in four positions. No. 1 shows the machine open in the first position. No. 2 shows it ready to receive the stockinet. No. 3 shows the sheet of stockinet laid across the dies and in position. No. 4 shows the press closed, forming and vulcanizing the shields. Mr. Squires invented the first Multiple machine as long ago as 1885. This he patented jointly with Isaac B. Kleinert. The machine shown in the accompanying illustrations was invented in 1892. The working machine makes one gross pairs at a time, the vulcanization lasting one and a half minutes, and the machine turning out about 60 gross in ten hours. It is the most rapid dress shield producer ever made, and the most accurate, and there are no damaged goods. The machine may be seen working in Factory E, of the I. B. Kleinert Rubber Co. (New York).



THE ELECTRIC VEHICLE PEOPLE INVEST IN TIRES.

THE report of the sale of the Rubber Tire Wheel Co. (Springfield, Ohio) is confirmed by the president, E. S. Kelly, in a statement for THE INDIA RUBBER WORLD, and by Charles W. Stapleton, president of the American Rubber Tire Co. (New York), the latter of which concerns was absorbed recently by the former. It is common report that the consideration was \$1,250,000. At the banking office of Emerson McMillin & Co., No. 40 Wall street, New York, it was stated that the purchase had been made by a syndicate, who were forming a stock company to carry on the solid rubber tire business, the details of which would be announced as soon as completed. Mr. McMillin is a member of the syndicate, and others are Stephen Peabody, broker, of New York; William L. Elkins, Jr., whose father has large financial interests in New York; and Isaac L. Rice, president of the Electric Vehicle Co. (Philadelphia), the parent of a long list of companies incorporated recently to develop the electric vehicle business. At Mr. McMillin's office it was stated that the interests back of the rubber tire deal and those of the electric vehicle companies were identical.

Some confusion has been caused in the public mind as to the parties interested in this transfer, on account of a published report which mentioned Richard Croker as one of the purchasers. Under the heading "New Incorporations," on another page, will be found a mention of the rubber tire interest with which a son of Mr. Croker is identified.

THE Rubber Tire Wheel Co. (Springfield, Ohio) were incorporated on June 2, 1894, under the laws of Ohio, to manufacture a solid rubber tire patented late in 1893 by Arthur W. Grant, its distinctive feature being a pair of longitudinal wires running through the rubber, instead of being held on by means of compression in steel channeled rims, as was true of the Shrewsbury and Talbot tire, then in wide use in England and to a small extent in America, under licenses from the English patentees. The new Springfield tire was exhibited at the Philadelphia carriage convention in October, 1894, and illustrated in THE INDIA RUBBER WORLD of December 10, 1894. The number of sets made for the company in that year, beginning in April, was 611. On May 10, 1895, THE INDIA RUBBER WORLD announced that the Springfield tire had been adopted, by the principal licensee in this country under the English patents. By that time 4500 sets had been made. The original incorporators of the Springfield company were E. S. Kelly, A. W. Grant, J. W. Stafford, O. W. Kelly, and John M. Cushing. The original capital was \$10,000, which was increased on November 2, 1894, to \$30,000. By May, 1895, the company was capitalized at \$45,000. The officers were: E. S. Kelly, president; A. W. Grant, vice-president; O. W. Kelly, secretary and treasurer.

The increase in the business since is indicated by the fact that the company have arranged for the production during 1899, in the United States alone, of 50,000 sets of tires, which will require 1,000,000 pounds of crude rubber, the compounds used containing about 40 per cent. of rubber. The company have not manufactured their own rubber parts, but have made the channeled rims or licensed other firms to make them. The Kelly-Springfield tire has been introduced in Canada, where the Gutta Percha and Rubber Manufacturing Co. of Toronto, Limited, are the licensees. They are also in large use in

Europe, taking the lead over all others in Paris, where a branch factory exists. The company have licensees in London, Glasgow, Dublin, Berlin, and Milan, who contract with local rubber manufacturers for the rubber parts. The company have 92 licensees in the United States, several of which are incorporated as rubber tire companies, as follows:

The Albany Rubber Tire Co.	Albany, N. Y.
The Munford Rubber Tire Co.	Atlanta, Ga.
The Baltimore Rubber Tire Co.	Baltimore, Md.
	Washington, D. C.
The Birmingham Rubber Tire Wheel Co.	Birmingham, Ala.
The Des Moines Rubber Tire Co.	Des Moines, Ia.
	Davenport, Ia.
The Detroit Rubber Tire Co.	Detroit, Mich.
The Nashville Rubber Tire Co.	Memphis, Tenn.
	Nashville, Tenn.
The Springfield Rubber Tire Co.	New Haven, Conn.
The Springfield Rubber Tire Wheel Co.	Rochester, N. Y.
The Wilmington Rubber Tire Co.	Wilmington, Del.

A subsequent patent was issued to A. W. Grant—No. 554,675, in 1896—and under this a number of infringement suits have been brought by the Springfield company. One was against the American Rubber Tire Co. (mentioned below), who were doing a large business in New York in supplying solid tires for vehicles. A decision in this case was rendered December 27, 1898, by Judge Thomas, in the United States district court for southern New York, sitting in Brooklyn. The decision read:

The defendant has been selling the precise tire made by the complainant pursuant to its patent, or, if there is any deviation in form, it is so slight as to be observable only upon the most careful scrutiny. The defendant excuses this appropriation upon the ground that the complainant's combination has been so thoroughly anticipated by previous patents as to present in function or result no patentable invention. The Grant tire, as compared with any previous tire, shows decided functional characteristics, and when any one or more similar parts are used, they are used in such changed connection with other parts that they effect a different result.

Following this decision the Springfield and American companies joined their interests. Next an understanding was reached with several rubber manufacturing concerns, whereby infringement suits were withdrawn on condition that the Grant patents be recognized. Dating from February 1, 1899, contracts were entered into by which the Springfield company's orders for rubber will be divided between the B. F. Goodrich Co., the Diamond Rubber Co., and the India Rubber Co., of Akron, Ohio, and the Hartford Rubber Works, of Hartford, Conn., said contracts to last for fourteen years, or during the life of the leading patent.

The sale covers not only the American Rubber Tire Co. (New York), but also the Imperial Rubber Tire Co., and the Firestone Rubber Tire Co., two selling agencies in Chicago. The Imperial company was the outgrowth of the selling agency of the Springfield company started some years since by Kelly, Maus & Co., in Chicago. Recently it was bought out by the Firestone company, though this fact was not known generally. Suits are still pending against the Victor and Goodyear tire companies, also mentioned below, as well as against various vehicle manufacturers who have been equipping their wheels with solid tires from various sources.

The American Rubber Tire Co. (New York) adopted this name September 15, 1896, having been known previously as the Columbia Pneumatic Wagon Wheel Co. (Oneida, N. Y.); capital, \$100,000. President, Charles W. Stapleton; vice president, J.

M. Goldstein; secretary and treasurer, A. S. Whitman; general manager, J. F. Aldrich. The Oneida Rubber Tire Works (Oneida, N. Y.) are licensees under the above named corporation.

The Victor Rubber Tire Co. (Springfield, Ohio) were incorporated in June, 1895, by Frank Torrence, Theodore Blosson, and R. F. Houston, to exploit a solid tire invented by Blosson. They were reorganized in March, 1898, with \$100,000 capital, with J. S. Harshman, president and treasurer; Chandler Robbins, vice president; and John G. Webb, secretary and general manager. They have since erected a rubber plant near Springfield, with Alfred T. Holt, superintendent.

The Goodyear Tire and Rubber Co. (Akron, Ohio) were incorporated in September, 1898, with \$100,000 capital. President, D. E. Hill; vice president, G. R. Hill; treasurer, H. B. Manton; secretary, C. W. Seiberling. They have a well equipped factory and are manufacturing tires for sale direct to carriage-builders. S. S. Miller is superintendent.

THE Goodyear Tire and Rubber Co. (Akron, Ohio) write to THE INDIA RUBBER WORLD: "We have nothing whatever to do with any of the consolidations or stock jobbing schemes now going on. Our factory is run on an independent basis and our carriage tire department is busy on our new tire on which we have secured letters patent [and which is described elsewhere in this paper]. The tire we are making we have demonstrated to be the best, both in appearance and practical points, that has appeared in recent years. We are not taking this tire up on account of any of the foolish suits pending for alleged infringement. These suits are for advertising purposes strictly, and have no bearing on the situation, except that they were used to secure a long price for a certain tire company so badly pushed by competition that they thought it advisable to dispose of their business while in the height of their glory and under the cover of a decision rendered in their favor. The true value of this decision will be shown in a very short time. We do not believe the United States courts will ever uphold the kind of business that has been going on recently. Our position is strictly independent, anti-trust."

An official of the Victor Rubber Tire Co. (Springfield, Ohio) writes: "There is no truth in the report that the Victor Rubber Tire Co. have sold out to the Auto-Truck company. The Rubber Tire Wheel Co., of this city, have sold out to some firm in New York city. We expect to reap large benefits from the anti-trust position which we have taken, and in fact we are receiving letters every day, bearing on this point, which lead us to think that our position is stronger than heretofore. We were invited to go into the 'combination,' but politely declined."

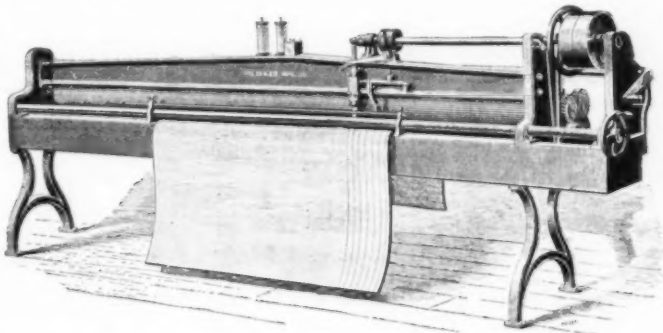
The company have issued a printed circular stating: "We have not sold out nor do we intend to do so. Our business has more than doubled this year, and we are building a large addition to our rubber factory which will more than quadruple our capacity."

RUBBER USED IN MINING.—According to Mr. Richard A. Parker, a mining engineer of prominence, writing to THE INDIA RUBBER WORLD from San Francisco, suction hose and air hose for rock drills constitute probably the two heaviest items of consumption of rubber goods in mining. Rubber belting for power and belts for concentrating machines would next follow in the order of quantity used. These would be followed by minor things—valves, gloves, etc.

LARGE MACHINES FOR SEWING BELTING.

THE manufacture of belting used for power transmission has caused a demand for very powerful and specially designed machines for the strong stitching, in long lengths, of several plies of rubber, canvas, or leather. These are, as a matter of course, operated by mechanical power. The illustration herewith represents the largest sewing machine ever constructed, it having been designed for simultaneously making parallel rows of stitching on heavy rubber, canvas, or other belting of unusual width, or for other similar duty. The machine will stitch any fabric, capable of being punctured by a needle, from $\frac{1}{8}$ inch to $1\frac{1}{2}$ inches thick and of any width up to 100 inches. The bed of this machine is 18 feet long and the whole weighs more than 5000 pounds. There are power driven feed rolls and special guides adjustable for various widths of material. The end of the frame, at the left hand, can be opened so that not only can a wide and heavy belt be stitched lengthwise, but the ends can also be lapped and stitched together before taking it from the machine.

This machine was made by the Singer Manufacturing Co. (New York), and belongs to their "Class 9." The same company manufacture three classes of machines—"5," "8," and



"9"—all of the same general character, but varying in capacity. In "Class 5" the extreme length of the bed is 32 inches and the clear space on the bed from needle to base of arm is 19 inches. The machines of this class will stitch to the center of a belt 38 inches wide and $\frac{1}{4}$ inch in thickness. The length of stitch may be varied from $\frac{1}{8}$, $\frac{1}{4}$, and $\frac{3}{8}$ inch.

One variety of this class—No. 5-9—is arranged to make either "straight" or "zigzag" stitching, as preferred. Machines of "Class 8" have a bed 4 feet long, and are capable of stitching to the center of a belt 56 inches wide.

The machines of "Class 8" can be fitted with a special auxiliary presser-foot for use in stitching soft or padded goods. This is attached to and works in conjunction with the needle-bar, pressing the soft material down so as to give free action to the vibrating presser and fully protecting the needle from being caught or sprung out of place.

ADVANCE IN CANADIAN RUBBERS.

ALL the Canadian manufacturers of rubber footwear were represented at a meeting held in Montreal on March 30, at which a revision was agreed upon, both in lists and in discounts, with the net result of advancing manufacturers' prices between 9 and 10 per cent. The discounts will be 20 per cent. from the gross list to September 30, 1899, and 15 and $2\frac{1}{2}$ per cent. from that date to March 31, 1900. Last year there was an extra discount of 5 per cent., which has been abolished.

NEWS OF THE RUBBER TRADE.

THE Boomer & Boschert Press Co. (Syracuse, N. Y.) have furnished recently to the Jenkins Rubber Co., at Elizabeth, N. J., one of their 30"×30" knuckle joint vulcanizing presses. Also, to the Omo Manufacturing Co., at Middletown, Conn., a 40"×40" knuckle joint power steam plate press. Also, to the C. Roberts Rubber Co., at Newark, N. J., a 100 ton knuckle joint baling press.

=The Toronto Rubber Shoe Manufacturing Co., Limited (Toronto), again inform THE INDIA RUBBER WORLD that there is nothing new to report with regard to the site for the rebuilding of their factory, burned during the winter.

=The Empire Rubber Manufacturing Co. are removing their New York office and store from Nos. 58-60 to Nos. 88-90 Reade street. The reason for the removal is that the former building is to be remodelled; the latter was long occupied by the general offices of the United States Rubber Co. Manager E. L. Baldwin reports that he will have larger and better accommodations in his new quarters.

=Mr. James Bennett Forsyth has not accepted a position as director in Champion Button Hole Machine Co. (Boston), as reported, for the reason that his many existing business engagements preclude his forming such a new connection.

=The Excelsior Supply Co. (Chicago) list in their catalogue of bicycle supplies two grades of single-tube tires, manufactured for them by the India Rubber Co. (Akron, Ohio). They are branded "Excelsior" (guaranteed) and "Famous" (un-guaranteed).

=The Enterprise Rubber Co. (Boston) entertained their salesmen at dinner at the Parker House on the evening of April 13.

=Selling Agent E. I. Aldrich, of the Hood Rubber Co., made a western trip during the month, going as far as St. Louis.

=The Lycoming Rubber Co. (Williamsport, Pa.), represented in Chicago by F. O. Kettering, have removed to the store at Nos. 240-242 Monroe street, vacated recently by A. D. Wentz & Co.

=The Goodyear Rubber Co.'s Chicago house have secured a contract for supplying rubber druggists' sundries to the public institutions of Cook county, Ill.

=A controlling interest in the J. F. W. Dorman Co. (Baltimore) having changed hands, a new rubber stamp concern has been organized in the same city by late members of it, all of whom were long associated with the late J. F. W. Dorman. The new concern is The Dorman Co., No. 23 North Howard street. William A. Moore is president; William A. Dorman, secretary; and John Higgins, treasurer.

=The American Tire Co. (No. 166 King street, west, Toronto) have become the licensees and manufacturers in Canada of the "G. & J." bicycle tires.

=The Hodgman Rubber Co. (New York) have issued a "Catalogue of Sporting Goods" which is comprehensive, up to date, and attractive in appearance, a copy of which can be had for the asking.

=The annual meeting of the stockholders of the Joseph Dixon Crucible Co. (Jersey City, N. J.) was held on April 17, and out of a possible vote of 7345 shares, 7069 were voted for the reelection of the old board, consisting of Edward F. C. Young, John A. Walker, Daniel T. Hoag, Richard Butler, William Murray, Alexander T. McGill, and Joseph D. Bedle. President

E. F. C. Young; Vice President and Treasurer John A. Walker; Secretary George E. Long were reelected by the directors. Judge Joseph D. Bedle was also reelected counsel.

=*"Private Correspondence Made Public for the Benefit of Manufacturers of Rubber Goods,"* is the heading of an exceedingly interesting circular, sent out by William Eggers, mold maker, No. 292 Graham street, Brooklyn, N. Y. If Mr. Eggers is as successful and original in mold making as he is in writing original circulars, he should have the cream of the trade.

=Mr. C. L. Higgins, of Montreal, and Mr. Albert T. Holt, superintendent of the Victor Rubber Tire Co. (Springfield, Ohio), were visitors at the office of THE INDIA RUBBER WORLD recently.

=The advertisement in another column of a London house that has a clientèle among English, French, German, and Belgian rubber stores for an extensive line of American rubber goods, is a straw which shows which way the export wind is blowing.

=The photographic views, from which the plates were made for the new catalogue of Parker, Stearns & Sutton (New York), were the work of Mr. Benjamin F. Sutton, secretary of the company, and all agree that in his grouping and effects he showed that artistic sense for which he is famous among his friends.

=By the explosion of a press used in the manufacture of dress shields at the factory of the I. B. Kleinert Rubber Co. (College Point, L. I.), Mr. George Weisbecker was recently badly scalded. The accident was due to the faulty construction of the press.

=The new addition to the plant of the La Crosse Rubber Mills Co. (La Crosse, Wis.) will contain a 250-horse power Corliss engine, two mixing mills, two spreaders, and some smaller machinery and vulcanizers, all of which will be running by June 1.

=The Hon. E. S. Converse, of the Boston Rubber Shoe Co., has purchased the property adjoining the Converse building, in Boston, the property Nos. 6-12 Milk street. The estate has a frontage of 51 feet, and is assessed at \$113,800, but the purchase price is reported to have been larger.

=At a meeting of the directors of the American Commercial Rubber Co. (Elizabeth, N. J.) on April 8, a quarterly dividend of 2 per cent. on the preferred stock was declared. Charles F. Hart, the secretary and treasurer and manager, reports that the factory has orders for proofing work which will keep it busy for several months. The factory is to be enlarged, and it is the intention, a little later, to begin the manufacture of rubber shoes.

=The Boston Belting Co. are sending to the trade a timely suggestion to "Look over your outfit from basement to roof—search for the weak spots in the line of rubber and let us strengthen them right now."

=The Beacon Falls Rubber Shoe Co. have leased the first floor and basement at Nos. 207-209 Monroe street, Chicago, which will be the headquarters in that city of their selling agent, A. D. Wentz.

=Charles B. Case, receiver of the Eastern Rubber Manufacturing Co., moved before the chancellor at Trenton, N. J., on April 11, for the confirmation of his accounts, for counsel fees and costs, and for an order discharging him as receiver.

=Somebody suggests that it would be well to get out russet rubber heels, because of the certainty of there being a demand for them.

=The Glendale Elastic Fabrics Co. (Easthampton, Mass.) on March 24 reflected S. T. Seelye president and Joseph W. Green, Jr., treasurer, and declared an annual dividend of 6 cents per pound.

=The name Standard Rubber Co. has been adopted by the company known in the past as the Standard Rubber Corporation (Brockton, Mass.). They have opened a branch sales office for their mackintoshes at No. 225 Dearborn street, Chicago, and closed the St. Louis branch, which served formerly as headquarters for their trade in the West.

=The Mutual Rubber Manufacturing Co. (No. 3 East Eighth street, Trenton, N. J.) advise THE INDIA RUBBER WORLD that \$3500 capital has been paid in and that the object of the company is to enter the rubber brokerage business, their charter giving them the privilege of manufacturing if they should so desire.

=The Lycoming Rubber Co. (Williamsport, Pa.) have installed a Corliss 800 horse power engine, for which steam is furnished by three 72 inch tubular boilers. Rope drive power will be used, the equipment including 2700 feet of rope. During a year \$6000 has been spent in improving the fire protection system.

=A booklet on the testing of mill hose, with excellent illustrations showing the effect of service on both warp and woof of the cotton covering, has been brought out by that expert in woven and knitted hose, Mr. E. E. Sibley, treasurer of the American Fire Hose Co. (Chelsea, Mass.)

=In response to an inquiry, it may be stated that the Chatterton compound is manufactured in the United States by C. S. Knowles, No. 7 Arch street, Boston.

=The news comes from Japan that an ingenious Japanese, after trying to import tires from England for the "jinriksha," has started to manufacture the tires for himself.

=A copy of a United States patent on a new and what appears to be thoroughly practical pneumatic tire has been sent us by Mr. A. J. Whistler of Kokomo, Ind. The tire is so made that it can be opened at any point and repaired without disfiguring the exterior of the tire.

=The Franklin Rubber Co. (Boston) are adding to their manufacturing plant some fifty Singer sewing machines. This is the second equipment within two years, denoting a steady and healthful growth in their business.

=Mr. F. W. Heustis is the patentee of a new and excellent carriage tire which may be seen at his office, No. 170 Summer street, Boston.

=The Royal Mackintosh Manufacturing Co. have removed from No. 219 Grand street to No. 725 Third avenue, New York.

=Mr. S. A. White, No. 85 High street, Boston, a well-known manufacturer of rubber cements, is back from a winter vacation in California.

=Mr. Edward Black, formerly superintendent of the Columbia Rubber Co. (Boston), has accepted the superintendency of the Clifton Rubber Co. at Clarendon Hills, Mass.

=The Hon. L. D. Apsley has returned from Hot Springs, Ark., very much improved in health.

=The Plymouth Rubber Co. (Stoughton, Mass.) have added to their factory equipment the machinery necessary for the manufacture of mechanical rubber goods, a line that they are now successfully following.

=The New York Commercial Co. have removed to more commodious and comfortable offices, in the Dun building, at Broadway and Duane street, New York.

=One of the most difficult things in business is the creation of effective trade marks. Of all that are in existence, there are few that are either so novel or so beautiful as to attract continuous attention.



One of the best efforts in that line yet to be noted is the trade mark of the Victor Rubber Tire Co. (Springfield,

Ohio), which is here reproduced.

=Several officials of the Pope Manufacturing Co. (Hartford, Conn.) visited New York recently to arrange for the transfer of the motor carriage department of that company to the Columbia Automobile Co., incorporated March 22 in New Jersey, with \$3,000,000 capital. Colonel Albert A. Pope holds a large interest in the new company. William C. Whitney is said also to be interested. It is reported that they mean to create at Hartford the largest automobile plant in the world.

=The National India Rubber Co.'s factory (Bristol, R. I.) resumed operations on April 18, having closed on March 31. The Woonsocket Rubber Co.'s factories were expected to be running by May 1. The American Rubber Co.'s factory (Cambridgeport, Mass.) started up on April 3. The two factories of the Boston Rubber Shoe Co. were closed on April 13, for the annual two weeks' shut down. The factory of The L. Candee & Co. (New Haven, Conn.) resumed work on April 3, after a shutdown of two weeks.

=The proposed bicycle trust has not yet taken shape. A. G. Spalding has options on most of the important bicycle plants, running to June 1. The option which he held on the Western Wheel Works (Chicago) expired on April 8, and the owners of that plant refused to extend it, which is the only basis for the published report that the trust plan has failed.

=Mr. S. M. Evans, who so successfully interests rubber manufacturers in the products of the Picher Lead Co., is on a trip among the rubber mills in the East.

=It is rumored that a new hard rubber factory will be started at Akron, Ohio, by a company which will include B. G. Work, who is understood to have been a stockholder in the Rubber Tire Wheel Co., recently sold out at a handsome price.

=The plant is for sale of the Stuart Rubber Co. (No. 124 Second street, Milwaukee, Wis.), engaged since 1874 in the manufacture of druggists' rubber goods. It includes molds, press, etc. The former proprietor, P. A. Stuart, died recently.

=Mr. Robert B. Baird, who has been so long and so favorably known in the crude rubber trade, has severed his connection with George A. Alden & Co. (Boston) and gone into business on his own account, with offices at No. 67 Chauncey street, Boston. He will be the representative for New England and Canada for Otto G. Mayer & Co., rubber importers in New York, and for Loewenthal & Morgenstern, rubber reclaimers, also of New York. Mr. Baird's acquaintance with the rubber manufacturers of the section referred to is such as to insure his success in his new venture.

THE BYFIELD RUBBER CO. BUSY.

THE new catalogue of this company is due to appear by this date. During a year past they have run constantly, except for taking stock in June, January, and April, which occupied only about six days altogether. Lately they have run from 15 to 24 hours a day, and their production has reached as high as 25,000 pairs a week. They are planning a daily average production of 4000 pairs for the current season. They advise THE INDIA RUBBER WORLD that the only difficulty they have had since starting has been that their capacity is too small to fill orders with dispatch, for which reason some orders have been countermanded. They have not been able, until within a few weeks, to put many goods in store.

SALE OF THE JOSEPH BANIGAN RUBBER CO.

THE following statement has been furnished to THE INDIA RUBBER WORLD by Mr. Walter S. Ballou: "The executors of the estate of the late Joseph Banigan, in settling his affairs, deemed it wise to sell their holdings in The Joseph Banigan Rubber Co. They sold their stock to Providence parties. This necessitated a reorganization of the board of directors. That organization stands as follows: Samuel P. Colt, Edward R. Rice, Clarence H. Guild, John J. Watson, Jr., and Walter S. Ballou. The officers of the organization are W. S. Ballou, president and general manager, and John J. Watson, Jr., treasurer. The management of the company and the sale of the product will move along the same lines as in the past. The withdrawal of the Banigan interests is the only real change."

This company was incorporated under the Rhode Island laws in November, 1896, with a board of directors consisting of the late Joseph Banigan (president), John J. Banigan (vice-president), Walter S. Ballou (secretary and treasurer), William B. Banigan, and E. R. Rice. The manufacture of rubber footwear was begun at once in what had been the Saxon woolen mill, at Olneyville. President Banigan died in July, 1898, being succeeded in office by his eldest son, while Patrick T. Banigan, a brother of Joseph Banigan, joined the board and became vice-president. The news of the purchase of an interest in the company by Col. Samuel P. Colt and his friends became public on April 3, and aroused no little interest, for the reason that it implied an end to the competition between the company and the United States Rubber Co. The selling agents of the company are: Edward R. Rice, Buffalo, N. Y., and Chicago; C. L. Weaver & Co., Boston; American Hand Sewed Shoe Co., Omaha; Linthicum Rubber Co., Baltimore; and Bedgood & Co., Melbourne, Australia.

UNITED STATES RUBBER CO.

THE annual meeting of the stockholders of the United States Rubber Co. for the election of directors and for the transaction of any other business which may properly be brought before the meeting will be held at the office of the company in New Brunswick, N. J., on Tuesday, May 16, at 12 o'clock M. Transfer books will be closed from April 17 to May 17.

The board of directors of the company on April 6 declared a quarterly dividend of 2 per cent. on the preferred stock, from the net earnings for the fiscal year ending March 31, 1899, to stockholders of record on April 17, payable April 29. The disbursement will amount to \$470,510. This is the third quarterly dividend for the fiscal year lately closed. The fourth dividend for the year will be due, in the ordinary course, at the end of July next.

THE RUMORED ELASTIC FABRICS COMBINE.

THE rumors which have been current since the beginning of the year lately became active again. On April 10 the newspapers reported that Lee, Higginson & Co. (Boston) had obtained options on fourteen concerns, including the Easthampton Elastic Web Co., Glendale Elastic Fabrics Co., Nashawanuck Manufacturing Co., and George S. Colton Co., Easthampton, Mass.; Bridgeport Fabric Co., Bridgeport, Conn.; Hub Gore Co., Brockton, Mass.; T. Martin & Brother, Chelsea, Mass.; Montgomery Web Co., Newport Gore and Web Co., and Campbell Web Co., Newport, R. I.; Narrow Fabric Co., and Russell Manufacturing Co., Middletown, Conn. A capitalization at \$8,000,000 was mentioned.

In response to an inquiry Messrs. Lee, Higginson & Co., on April 11, advised THE INDIA RUBBER WORLD: "We are not ready at the present time to say anything in regard to the reports, which we very much regret to have seen in the daily press,

that a consolidation of the elastic fabrics companies is under consideration by us. These reports are all premature."

The treasurer of one of the leading companies named above said: "This list is all conjecture. Nothing definite can be said as yet." The *Hartford Courant* reports that Lee, Higginson & Co., tried to get an option on the Russell Manufacturing Co., but without success.

NEW BEDFORD RUBBER CO.'S OPENING.

THE formal opening of the new store of the New Bedford Rubber Co. (No. 128 Purchase street, New Bedford, Mass.) took place on April 15. The store was filled with visitors during the afternoon and evening. A graphophone concert was given from 2 to 5 P. M. and from 7.30 to 10.30. Manager James W. Cross advises THE INDIA RUBBER WORLD that they have a very fine store; in fact, one of the best in New England. The location is better than the old concern had, and they have a good trade already. They are pushing garden hose and cycle sundries "for all there is in it."

NEW INCORPORATIONS.

THE International Automobile and Vehicle Tire Co., April 15, under New Jersey laws; capital authorized, \$3,000,000. To manufacture and deal in rubber tires for automobiles, electric vehicles, bicycles, and other vehicles; to acquire patents and trademarks, and also shares of other corporations. Capital divided equally into preferred (cumulative 7 per cent.) and common shares. Incorporators: Richard S. Croker, No. 5 East Seventy-fourth street, New York (3 shares each preferred and common); Charles N. King, of the New Jersey Corporation Agency, No. 245 Washington street, Jersey City, N. J. (1 share each preferred and common); Frank E. Bradley, a lawyer having offices in New York, Montclair, N. J. (1 share each preferred and common); total, 10 shares subscribed.

The company are not yet organized, though Mr. Croker informs THE INDIA RUBBER WORLD that he will fill the position of vice president. He is also auditor of the New York Auto-Truck Co., in which his father, Richard Croker, is interested, and which company have been looking into the subject of tires suited for trucks. Mr. Croker, Jr., stated that the new company intended to manufacture tires, but they were not prepared to discuss the reported negotiations for the plant of the L. C. Chase & Co. (Chelsea, Mass.) or the Newton Rubber Works (Newton Upper Falls, Mass.) The report has since become public that on April 25 the stockholders of the Newton company approved the sale; also that the Reading Rubber Co. have been acquired and that Treasurer B. T. Morrison will enter the service of the new organization.

=The Consolidated Rubber Tire Co., April 17, under New Jersey laws; capital, \$10,000. Incorporators: Richard Stockton, Theodore Backus and Frank R. Hutchinson, all of Trenton; offices: No. 12 South Warren street, Trenton, N. J.; to manufacture rubber tires for vehicles of all kinds.

=Chapman-McLean Rubber Co. (Butler, N. J.), March 30, under New Jersey laws; capital, \$100,000. Incorporators: Edwin N. Chapman and John D. Chapman, Brooklyn, N. Y.; Joseph F. McLean, Butler, N. J. To continue the business of the firm of Chapman & McLean, organized recently to take over the soft rubber goods department of the Butler Hard Rubber Co.

=The Kokomo Rubber Co. (Kokomo, Ind.), capitalized at \$100,000, have been licensed to do business in Illinois, with a capital in that state of \$6000.

=The Pneumatic Cushion Rubber Heel Co. (Hartford, Conn.), under Connecticut laws; capital, \$10,000. Francis H. Hawthorne, of Boston, holds 191 of the 200 shares.

THE NEW RUBBER CONSOLIDATION.

THE Empire Rubber Manufacturing Co. (Trenton, N. J.) are reported to have been absorbed by the Rubber Goods Manufacturing Co., otherwise known as the new Rubber Trust. The Empire's principal production has been in rubber hose and bicycle tires, and the fact that they have figured on the list selected by the promoters of the new consolidation for their purposes may be taken as evidence that they have been doing a good business.

There are reports that a report is about due from a committee on appraisal who have been investigating the amount of business done by the companies embraced in the Rubber Goods Manufacturing Co.

Among the transactions in Rubber Goods shares on the curb, in New York, on April 25, were reported purchases of the preferred, aggregating 500 shares, by David Pfeiffer. The quotations that day were 34½ bid, 35 asked, for common; 81½ bid, 82 asked, for preferred. Trading was more active, and these figures represented an advance over the week before.

The New York *Times* of April 27 reports: "Rubber goods common and preferred continued very strong and made further net gains. The common, which closed on Tuesday at 34½ bid, sold above 36 yesterday, and closed at 36 bid, a net advance of 1½ points for the day. The preferred stock advanced to 82½ and closed at 82 bid, a net gain of one quarter of 1 point. No news in regard to the company to account for the rise has yet been made public, but it is said that important announcements will soon be made."

The New York *Journal of Commerce* of the same date reported: "The stock of the Rubber Goods Manufacturing company was unusually active and strong on the curb market yesterday. The reason for this, it is learned, is that the company has practically completed arrangements for the absorption of the Mechanical Rubber company. Stockholders of the latter were asked some time ago to deposit their stock in anticipation of a consolidation. The deal is being promoted by Charles R. Flint and William M. Ivins."

SALE OF A FACTORY IN ERIE.

THE plant of the Keystone Rubber Co. (Erie, Pa.) was sold during the past month in foreclosure. The purchasers were F. A. Wilcox, secretary of the India Rubber Co. (Akron, Ohio) at the time of its recent absorption by the new Rubber Trust, and Herbert DuPuy, of the Anderson & DuPuy Steel Works, of Pittsburgh. The new owners of the business will organize with \$100,000 capital paid in, and have applied for a charter under Pennsylvania laws. The name adopted is the Pennsylvania Rubber Co. Originally it was the Erie Rubber Co. There is a complete outfit for the manufacture of mechanical rubber goods, and the new company purpose making belting, packing, hose, bicycle and carriage tires, and mold work generally. H. A. Middleton, superintendent of the India Rubber Co.'s factory until recently—and previously for the L. C. Chase & Co. (Chelsea, Mass.)—will be a shareholder in the new company, and its superintendent.

WON BY THE AMERICAN DUNLOP TIRE CO.

THE ownership of bicycle tire patents is gradually narrowing down. Regarding certain late developments THE INDIA RUBBER WORLD is advised by the American Dunlop Tire Co.: Brown and Stillman, of Syracuse, N. Y.; Charles Metz, of Highlandville, Mass.; C. K. Welch, of Coventry, England; and Charles F. Roth of Cincinnati, Ohio, all claimed to have invented within a short period of each other what is now known

as the Dunlop tire. The parent Dunlop company owned the Welsh application. The interests of Brown and Stillman and Metz were combined and bought up by the Dunlop people, and in due course the patent was issued to Brown and Stillman and became the property of the American Dunlop Tire Co. That company brought suit for infringement the Phelps & Dingle Manufacturing Co. (Elizabeth, N. J.) who put in as part of their defense the Roth application, which they in the meantime had bought. The litigation ended in a victory for the Dunlop company. Messrs. Phelps and Dingle then went into the employment of the New Brunswick, N. J., who came into possession of the Roth interference, and thereupon began to press the interference in the patent office. After dragging on for a long time, the case has been decided in favor of the American Dunlop Tire Co., the Roth interference being thrown out.

BOSTON WOVEN HOSE AND RUBBER CO.

THE assignees announced a sale of the assets of this company at Boston at noon on April 28. No offer of less than \$700,000 cash was to be considered. THE INDIA RUBBER WORLD is informed that holders of claims amounting to \$1,205,000, of the total liabilities of \$1,410,000, had already accepted a cash offer of 57½ per cent, in full satisfaction, and it was presumed that the public sale would result in the assets passing into the hands of the persons making the above offer, who are understood to be acting in the interest of the old stockholders. The assignees did not feel justified, however, in winding up their connection with the business without giving every possible purchaser a chance to make a bid.

INDIVIDUAL MENTION.

MRS. ALICE M. SULLIVAN, wife of Dr. James E. Sullivan, has signified her intention to give \$10,000 to the library of the Brown University, at Providence, R. I., to be called the "Joseph Banigan Library Fund," as a memorial to her father, the late Joseph Banigan. It is to be devoted to the purchase of books relating to church history.

=Mr. Franklin Farrel, president of the Farrel Foundry and Machine Co. (Ansonia, Conn.), until lately president and principal stockholder in the Parrot Mining Co., is reported to have sold his holdings for \$3,600,000, of which over \$2,500,000 represented clear profit.

=Mr. William R. Whitehead, of the Whitehead Brothers Rubber Co. (Trenton, N. J.) has become president of the Spenazuma Gold Mining and Milling Co., of Graham county, Arizona. Their New York office is at No. 20 Broad street.

=Mr. Isaac Crocker, president of the Lawrence Rubber Co. (Lawrence, Mass.), together with a party of friends, made a recent visit to Havana and neighboring points in Cuba, an interesting account of which appears in the newspapers of his town.

=Mr. Frederick T. Ryder, secretary of the Boston Rubber Shoe Co., is back at his desk, his stay in Europe having been shorter than was at first intended.

=Mr. Arthur M. Waitt has been appointed superintendent of motive power and rolling stock of the New York Central railroad. He was formerly general master carbuilder of the Lake Shore and Michigan Southern railway, with headquarters at Cleveland, and has given much study to the subject of air-brake hose. A report by him on this subject, prepared for the Master Car Builders' Association, was summarized in THE INDIA RUBBER WORLD of September 1, 1898.

=The property recently reported to have been bought by Mr. Robert D. Evans at the southeast corner of Fifth avenue and Seventy-third street, New York, has since been reported as changing hands again—the latest purchase being in the interest of Howard Gould.

"WON'T SLIP" TIRES FOR AUTOMOBILES.

BAILEY'S "Won't Slip" tire, as adapted to motor carriages promises to be as much of a success as it has been on bicycles. Where a horse is attached to a vehicle, it is impossible for it to slew very badly, as the horse holds it. But a motor-carriage that gets to slipping is liable to skate all over the street, inviting all sorts of accidents. The "Won't Slip" tire wholly obviates this. Mr. W. Raleigh Pike says of this tire (and his opinion as an expert is well worth having): "My first trial was made last evening, and I assure you I could ride on the inside of the bunch at full speed and never slipped or bounced once. I hope you can realize what this means. I think you have got the finest tire on the market, a tire that the bunch must have. I feel very proud that I am the first racing man to use these tires for this purpose, and it doesn't make any difference whether I win or not, it will be the fault of my wheel or my condition, but with any wheel or in any condition I can do 50 per cent. better and surer work with a pair of your 'Won't Slip' tires for they are swifter and won't slip."

ATTENTION is called to the advertisement, on page xviii, of a valuable new book on "Crude Rubber and Compounding Ingredients."

MANAOS HAS AN ELECTRIC RAILWAY.

THE United States consul at Pará reported to his government on March 7: "To-day comes a large steamer packed with machinery of American manufacture, presumably sent by Mr. Charles R. Flint to complete the trolley electric railway in Manáos—one of the most important enterprises in this part of Brazil. The manager expects to have the road in operation within the next sixty days. The line is said to be some 15 miles in length, and the cost will be close to \$1,000,000. The company is incorporated under the laws of the state of New York, and Mr. Flint is treasurer."

OBITUARY.

JOHAN GALT SMITH, the senior member of the firm of linen merchants, at No. 52 White street, New York, which bears his name—J. Galt Smith & Co.—died on April 25 at his home in New York, aged 56 years. The firm also do a large business in supplying waterproofing fabrics to the rubber clothing trade.

HENRY OLIVER BURNHAM, some time engaged in the rubber trade at Andover, Mass., died March 21 at his home in Malden, Mass., in his seventy-sixth year.

REVIEW OF THE CRUDE RUBBER MARKET.

THE market for crude rubber has been quiet throughout the past month, at least so far as the situation at home is concerned, though the market is understood to have been more active across the Atlantic. For the most part business has been confined to the satisfaction of the current needs of manufacturers, who have shown a disposition to await easier prices before buying more freely. Meanwhile importers apparently have not felt inclined to stimulate trade by making concessions, in spite of the fact that the world's supply for a short time has been more liberal than for a year or two past.

Such changes as have been made in prices have been toward a slightly lower level, but this tendency has not progressed far enough either to encourage buyers to stock up with rubber, or to point to the possibility of lower prices for rubber goods. On the other hand, manufacturers appear to be unusually well supplied with orders, and they are understood to have met with success in demanding prices for their products more nearly commensurate with the cost of raw materials than has been the case since the era of high priced rubber began. An instance is quoted where a large manufacturer was obliged, in order to fill an order on time, to give the work to a competing firm, who, for the moment, were less crowded with work.

Conditions which have a bearing upon the price of crude rubber are the fact that practically all of the past season's crop has come into market, and that, even if the new crop were near at hand, manufacturers could better afford to pay present prices for old rubber than considerably lower figures for new, owing to the greater shrinkage of the latter. Besides, in addition to the steady run of orders for standard lines of goods, reported by all the manufacturers, there are prospects of a growing consumption of rubber for vehicle tires—a new industry, the extent of the development of which now seems practically without limit.

In regard to the financial situation, Albert B. Beers (broker in India-rubber and commercial paper, No. 58 William street, New York) advises us as follows:

"During the early part of April there was a sharp rise in call money, rates running up to from 6 to 10 per cent., which continued for several days, and this curtailed considerably the demand for commercial paper, but during the latter part of the month the market resumed its previous condition, with a fair demand for paper, and rubber names ruling at 4 @ 4½ per cent. for the best, and 5 @ 6 per cent for others."

The latest quotations in the New York market are:

PARÁ.			
Islands, fine, new...	1.00 @ 101	Accra strips.....	69 @ 70
Islands, fine, old.....	none here	Lagos buttons.....	66 @ 67
Islands, coarse, new...	69 @ 70	Lagos strips.....	67 @ 68
Islands, coarse, old...	none here	Liberian flake....	@
Upriver, fine, new....	100 @ 101	Madagascar, pinky...	86 @ 87
Upriver, fine, old....	102 @ 103	Madagascar, black ...	none here
Upriver, coarse, new...	85 @ 86	CENTRALS.	
Upriver, coarse, old...	none here	Esmeralda, sausage...	76 @ 77
Caucho (Peruvian) sheet	69 @ 70	Guayaquil, strip.....	62 @ 64
Caucho (Peruvian) strip	70 @ 71	Nicaragua, scrap ...	75 @ 76
Caucho (Peruvian) ball	81 @ 82	Mangabeira, sheet....	64 @ 65
AFRICAN.		EAST INDIAN.	
Tongues.....	63 @ 64	Assam.....	84
Sierra Leone.....	83 @ 84	Borneo.....	40 @ 54
Benguella.	75 @ 76	GUTTA-PERCHA.	
Congo ball.....	66 @ 67	Fine grade.....	1 50
Cameroon ball.....	64 @ 65	Medium.....	1.30
Flake and lumps.....	48 @ 49	Hard white.....	1.00
Accra flake.....	27 @ 28	Lower sorts.	50
Accra buttons.....	66 @ 67	Balata.....	

Late Pará cables quote:

Per Kilo.		Per Kilo	
Upriver, fine.....	11 \$ 700	Islands, fine	10 \$ 300
Upriver, coarse.....	8 \$ 900	Islands, coarse	6 \$ 000
Exchange 7½ d.			

NEW YORK RUBBER PRICES FOR MARCH.

1899.		1898.		1897.	
Upriver, fine.....	1.02 @ 1.07	94 @ 95	82 @ 83½		
Upriver, coarse	88 @ 90	73½ @ 75	52 @ 54		
Islands, fine.....	1.01 @ 1.05	92½ @ 93	80 @ 82		
Islands, coarse.....	71 @ 75	62½ @ 64	44½ @ 45		
Cameta, coarse.	72 @ 77	69 @ 71	51 @ 54		

STATISTICS OF PARA RUBBER.

FOLLOWING is a comparison for corresponding periods of three years, the figures denoting tons of 1000 kilograms:

NEW YORK.					
	Fine and Medium.	Coarse.	Total. 1899.	Total. 1898.	Total. 1897.
Stocks, February 28.....	323	85 =	408	342	493
Arrivals, March.....	2183	658 =	2841	1161	1057
Aggregating.....	2506	743 =	3249	1503	1550
Deliveries, March.....	2101	656 =	2757	1031	1036
Stocks, March 31.....	405	87 =	492	472	514

PARÁ.			ENGLAND.				
	1899.	1898.	1897.		1899.	1898.	1897.
Stock, February 28....	2225	530	860	735	580	1205	
Arrivals, March.....	2450	1730	1710	915	1290	1435	
Aggregating.....	4675	2260	2570	1650	1870	2640	
Deliveries, March.....	3445	1875	1648	750	875	775	
Stocks, March 31..	1230	385	922	900	995	1865	

	1899.	1898.	1897.
World's supply, March 31 (excluding Caucho).....	3543	2681	3961
Pará receipts, July 1 to March 31.....	21,365	19,160	18,960
Afloat from Pará to United States, March 31..	283	—	—
Afloat from Pará to Europe, March 31.....	638	—	—

HIGHER PRICES AT ANTWERP.

TO THE EDITOR OF THE INDIA RUBBER WORLD: At an inscription sale on April 12, there were about 44,300 kilograms of rubber offered, of which only 25,000 were sold. Prices were very irregular for various uncurrent African grades, but firm for the few lots of current Congo sorts. The most interesting lot was 50 tons Lopori (besides the above quantities), offered to arrive within three months. It was withdrawn and held for 10.75 francs per kilogram, which price (being 5 centimes higher than last price paid, on March 14) has not been paid yet.

The steamer *Leopoldville* has arrived from the Congo with about 210,000 kilograms, the most of which will be offered for sale on April 28. Actual stocks here amount to about 237,500 kilograms.

C. SCHMID & CO.

Antwerp, April 14, 1899.

E. Karcher & Co. report the following analysis of the grades and amounts which were to be offered on April 28, which sale occurred too late to permit prices to be given here in detail:

PARA RUBBER VIA EUROPE.

POUNDS.		
APRIL 1.—By the <i>Patria</i> =Hamburg:		
Reimers & Meyer (Fine and Medium)	17,000	
APRIL 3.—By the <i>Lucania</i> =Liverpool:		
George A. Alden & Co. (Caucho).....	12,300	
Crude Rubber Co. (Caucho).....	12,200	24,500
APRIL 15.—By the <i>Campania</i> =Liverpool:		
George A. Alden & Co. (Caucho).....	6,600	
Crude Rubber Co. (Caucho).....	6,400	13,100

OTHER ARRIVALS AT NEW YORK.

CENTRALS.		
POUNDS.		
MARCH 28.—By the <i>Alene</i> =Greytown:		
A. P. Strout.....	7,000	
Munoz & Esparilla.....	2,000	
Flint, Eddy & Co.....	1,500	
Andreas & Co.....	800	
For Bremen.....	500	11,800
MARCH 27.—By the <i>Carib</i> =Truxillo:		
Eggers & Heinlein.....	3,500	
Jose Agostini.....	2,000	
H. W. Peabody & Co.....	800	6,300
MARCH 29.—By the <i>Ardayhu</i> =Belize:		
Eggers & Heinlein.....	4,000	
K. Mandell & Co.....	2,000	

For London.....	2,000	10,000
MARCH 29.—By the <i>Majestic</i> =Liverpool:		
Reimers & Meyer.....	4,000	
MARCH 30.—By the <i>Macedonia</i> =Mexico:		
H. Marquardt & Co.....	5,000	
E. Steiger & Co.....	3,500	8,500
MARCH 29.—By the <i>Merida</i> =Montevideo:		
L. Johnson & Co.....	11,000	
MARCH 30.—By the <i>Bramble</i> =Colon:		
Hirzel, Feltman & Co.....	32,300	
M. Valverde & Co.....	3,000	
Holdan & Van Sickle.....	2,900	
G. Amsinck & Co.....	2,200	40,400
MARCH 31.—By the <i>El Mar</i> =New Orleans:		
A. T. Morse & Co.....	9,500	
MARCH 31.—By the <i>Segurana</i> =Mexico:		
H. Marquardt & Co.....	5,000	
E. Steiger & Co.....	900	5,900
APRIL 1.—By the <i>Montcalm</i> =London:		
George A. Alden & Co.....	30,000	
Crude Rubber Co.....	13,000	43,000
APRIL 1.—By the <i>Patria</i> =Hamburg:		
Reimers & Meyer.....	6,800	

Kilograms.

Lower Congo.....	18,831	Congo—Wamba.....	830
Upper Congo.....	19,438	Lake Leopold.....	10,401
Upper Congo—Lopori.....	1,371	Conakry.....	8,303
Upper Congo—Equateur.....	38,481	Cassamance.....	1,010
Upper Congo—Aruwimi.....	31,222	Sierra Leone.....	7,232
Upper Congo—Mongalla.....	10,208	Madagascar.....	1,710
Upper Congo—Sankuru.....	2,057	Sundries.....	992
Upper Congo—Uellé.....	19,524		
Upper Congo—Bangui.....	4,420	Total.....	176,030

ANTWERP RUBBER STATISTICS FOR MARCH.

[The Figures Denote Kilograms.]

DETAILS.	1899.	1898.	1897.	1896.	1895.
Stocks, February 28.....	250,311	230,752	185,743	48,308	63,892
Arrivals, March.....	250,081	166,910	108,515	63,352	62,723
Total.....	500,392	397,662	294,258	111,660	126,615
Sales in March.....	246,823	219,098	175,247	57,664	41,103
Stocks, March 31.....	253,569	178,564	119,011	53,996	85,512
Arrivals since January 1.....	761,945	487,844	318,783	155,205	124,713
Sales since January 1.....	771,716	403,743	339,401	190,063	78,633

IMPORTS FROM PARA AT NEW YORK.

March 30.—By the steamer *Hilary*, from Manáos:

IMPORTERS.	Fine.	Medium.	Coarse.	Caucho.	Total
Reimers & Meyer.....	16,800	2,500	18,700	40,400=	78,400
G. Amsinck & Co.....	52,700	5,000	—	—	57,700
Albert T. Morse & Co.....	16,500	2,100	2,600	38,600=	59,800
American Wringer Co.....	—	—	10,100	—	10,100
Otto G. Mayer & Co.....	22,200	5,100	6,400	14,500=	48,200
Boston Rubber Shoe Co.....	16,800	2,500	12,500	—	31,800
Lawrence Johnson & Co.....	25,400	3,900	5,000	—	34,300
Crude Rubber Co.....	2,500	1,100	1,000	—	4,600
Total.....	152,900	22,200	56,300	93,500=	324,900

April 10.—By the steamer *Tresco*, from Pará:

New York Commercial Co.....	97,200	14,300	47,800	39,200=	198,500
Crude Rubber Co.....	44,600	6,200	8,200	23,100=	82,100
Reimers & Meyer.....	128,200	21,300	55,600	6,100=	211,200
Albert T. Morse & Co.....	27,100	4,000	52,300	2,700=	86,100
Edmund Reeks & Co.....	3,000	200	2,100	41,400=	46,700
Otto G. Mayer & Co.....	28,200	3,200	6,200	—	37,600
Hagemeyer & Brunn.....	8,400	—	6,400	—	14,800
Peerless Rubber Mfg. Co.....	—	—	8,900	—	8,900
American Wringer Co.....	—	—	5,200	—	5,200
Herbst Brothers.....	1,100	—	400	—	1,500

Total..... 337,800 49,200 193,100 112,500= 692,600

NOTE.—The steamer *Bernard* sailed from Pará for New York on April 16, with 600 tons on board, and the *Sobralense* on April 24, with 150 tons.

APRIL 3.—By the *New York*=Southampton:

Reimers & Meyer..... 6,000

APRIL 3.—By the *Lucania*=Liverpool:

Livesey & Co..... 3,500
 Reimers & Meyer..... 10,800
 Herbst Brothers..... 1,300 15,500

APRIL 4.—By the *Alleghany*=Cartagena:

Kunhardt & Co..... 6,400
 J. H. Lang..... 5,600
 D. A. De Lima & Co..... 2,500
 Lanman & Kemp..... 2,000
 Flint, Eddy & Co..... 1,500
 Gutterman, Rosenfeld & Co..... 1,500
 Roldan & Van Sickle..... 1,000
 Mecke & Co..... 300 20,200

APRIL 4.—By the *Hudson*=New Orleans:

A. N. Rotholz..... 3,000
 H. W. Peabody & Co..... 1,000
 A. T. Morse & Co..... 1,500 6,000

APRIL 6.—By the *El Dorado*=New Orleans:

A. T. Morse & Co..... 15,000

APRIL 8.—By the *St. Louis*=Southampton:

J. H. Rossback & Bros..... 4,800
 Herbst Brothers..... 2,000 6,500

APRIL 6.—By the *Advances*=Colon:

Flint, Eddy & Co..... 4,700

I. Brandon & Bros.	6,300
Dumarest & Co.	3,600
Crude Rubber Co.	2,800
Mosie Brothers.	2,000
A. M. Capen Sons.	1,000
Roldan & Van Sickle.	800
A. Santos & Co.	700
Lauman & Kemp.	400
G. Amsinck & Co.	300
W. R. Grace & Co.	300
Ascensio & Cassio.	300
	23,000

APRIL 10.—By the <i>Louisiana</i> =New Orleans:	
Albert T. Morse & Co.	11,000
Lawrence Johnson & Co.	2,000
W. Loiza & Co.	1,500
	14,500

APRIL 10.—By the <i>Altai</i> =Greytown:	
A. F. Strout.	3,000
G. Amsinck & Co.	2,000
Kunhardt & Co.	2,000
Andreas & Co.	1,500
Roldan & Van Sickle.	1,500
D. A. De Lima & Co.	1,000
Punderford & Co.	500
Samper & Co.	400
A. D. Straus & Co.	400
Ellinger Brothers.	400
	12,700

APRIL 14.—By the <i>Financé</i> =Colon:	
G. Amsinck & Co.	8,600
Flint, Eddy & Co.	3,700
A. F. Strout.	2,500
Lauman & Kemp.	2,100
A. M. Capen Sons.	2,000
I. Brandon & Bros.	2,000
A. Jimenez & Co.	1,400
W. Loiza & Co.	1,200
F. Probst & Co.	600
W. R. Grace & Co.	400
H. Marquardt & Co.	300
Samuel Hermanos.	300
	25,100

APRIL 14.—By the <i>Bufon</i> =Pernambuco:	
Lawrence Johnson & Co.	5,200
J. H. Rossback & Bros.	4,000
	9,200

APRIL 15.—By the <i>City of Washington</i> =Mexico:	
H. Marquardt & Co.	2,100
E. Steiger & Co.	600
F. Probst & Co.	1,000
E. N. Tibbals.	600
	9,700

APRIL 15.—By the <i>Excelior</i> =New Orleans:	
Albert T. Morse & Co.	5,000
	10,000

APRIL 15.—By the <i>Graf Waldersee</i> =Hamburg:	
Reimers & Meyer.	10,000

APRIL 15.—By the <i>Adirondack</i> =Port Limon:	
Kunhardt & Co.	3,000
Gulterman, Rosenfeld & Co.	1,500
A. N. Rotholz.	700
G. Amsinck & Co.	700
For London.	800
	5,700

APRIL 15.—By the <i>Itaka</i> =Mexico:	
H. Marquardt & Co.	5,000
Flint, Eddy & Co.	2,000
L. Monjo, Jr., & Co.	1,500
Pyrograve Wood Co.	300
J. W. Wilson & Co.	100
	8,800

APRIL 15.—By the <i>Ardanhu</i> =Truxillo:	
Eggers & Heinlein.	5,000
K. Mandell & Co.	700
	5,700

APRIL 21.—By the <i>Galileo</i> =Bahia:	
New York Commercial Co.	3,500
J. H. Rossback & Bros.	4,000
	7,500

APRIL 22.—By the <i>Cymric</i> =Liverpool:	
Albert T. Morse & Co.	6,000
Reimers & Meyer.	4,000
	10,000

APRIL 24.—By the <i>La Gascogne</i> =Havre:	
Emile Boris.	2,500

APRIL 25.—By the <i>Alene</i> =Greytown:	
A. F. Strout.	10,000
Andreas & Co.	2,000
Kunhardt & Co.	2,000
H. W. Peabody & Co.	2,000
Munoz & Espriella.	1,000
For Bremen.	1,500
	18,500

APRIL 25.—By the <i>Algiers</i> =New Orleans:	
Albert T. Morse & Co.	10,000

AFRICANS.

MARCH 11.—By the <i>Etruria</i> =Liverpool:	
George A. Alden & Co.	56,500
A. T. Morse & Co.	11,000
Crude Rubber Co.	77,000
William Wright & Co.	23,000
Otto G. Mayer & Co.	38,500
Livesey & Co.	7,000
Reimers & Meyer.	17,000
	232,000

MARCH 13.—By the <i>Areadis</i> =Hamburg:	
George A. Alden & Co.	22,000

Reimers & Meyer.	13,000	39,000
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MARCH 16.—By the <i>Teutonic</i> =Liverpool:	
George A. Alden & Co.	48,000
Crude Rubber Co.	45,000
Otto G. Mayer & Co.	13,000
Livesey & Co.	2,000
Windmuller & Roelker.	10,000
	116,000

MARCH 18.—By the <i>Campania</i> =Liverpool:	
Reimers & Meyer.	25,000
George A. Alden & Co.	18,000
Crude Rubber Co.	18,000
Otto G. Mayer & Co.	24,000
William Wright & Co.	27,500
Joseph Cantor.	5,000
Albert T. Morse & Co.	11,000
	128,500

MARCH 27.—By the <i>Pretoria</i> =Hamburg:	
George A. Alden & Co.	38,000
Reimers & Meyer.	50,000
Crude Rubber Co.	18,500
Windmuller & Roelker.	4,000
	108,500

MARCH 28.—By the <i>Friesland</i> =Antwerp:	
George A. Alden & Co.	48,000
Albert T. Morse & Co.	44,000
Reimers & Meyer.	48,000
Crude Rubber Co.	48,000
Boston Rubber Shoe Co.	30,000
	206,000

MARCH 29.—By the <i>Majestic</i> =Liverpool:	
George A. Alden & Co.	21,000
William Wright & Co.	33,000
Crude Rubber Co.	19,000
Reimers & Meyer.	10,000
	73,000

APRIL 1.—By the <i>Montcalm</i> =London:	
Otto G. Mayer & Co.	8,000

APRIL 1.—By the <i>Patria</i> =Hamburg:	
Reimers & Meyer.	10,000

APRIL 3.—By the <i>Lucania</i> =Liverpool:	
George A. Alden & Co.	22,000
Otto G. Mayer & Co.	23,000
Reimers & Meyer.	22,000
Livesey & Co.	5,000
H. H. Smythe.	4,000
	76,000

APRIL 5.—By the <i>Spartan Prince</i> =Genoa:	
George A. Alden & Co.	8,500

APRIL 7.—By the <i>Werkendam</i> =Rotterdam:	
Reimers & Meyer.	16,000
Otto G. Mayer & Co.	13,000
	29,000

APRIL 8.—By the <i>Britannic</i> =Liverpool:	
George A. Alden & Co.	18,000
Reimers & Meyer.	21,000
Crude Rubber Co.	17,500
Windmuller & Roelker.	1,600
	57,500

APRIL 8.—By the <i>Phanicia</i> =Hamburg:	
George A. Alden & Co.	24,000
Reimers & Meyer.	8,000
	32,000

APRIL 10.—By the <i>Efruria</i> =Liverpool:	
George A. Alden & Co.	15,000
Crude Rubber Co.	5,000
	20,000

APRIL 10.—By the <i>British King</i> =Antwerp:	
George A. Alden & Co.	8,500

APRIL 15.—By the <i>Teutonic</i> =Liverpool:	
Reimers & Meyer.	21,000

APRIL 15.—By the <i>Campania</i> =Liverpool:	
Geo. A. Alden & Co.	21,000
Livesey & Co.	19,000
Crude Rubber Co.	18,000
Reimers & Meyer.	12,500
	70,500

APRIL 15.—By the <i>Peninsular</i> =Lisbon:	
Reimers & Meyer.	137,000
Albert T. Morse & Co.	115,000
George A. Alden & Co.	39,000
Crude Rubber Co.	39,000
Windmuller & Roelker.	2,500
	332,500

APRIL 21.—By the <i>Pennsylvania</i> =Hamburg:	
Reimers & Meyer.	55,000

APRIL 22.—By the <i>Cymric</i> =Liverpool:	
George A. Alden & Co.	35,000
Otto G. Mayer & Co.	25,000
Crude Rubber Co.	42,000
Livesey & Co.	11,000
Albert T. Morse & Co.	14,000
	127,000

APRIL 24.—By the <i>Umbria</i> =Liverpool:	
William Wright & Co.	60,000
George A. Alden & Co.	12,000
Livesey & Co.	6,500
Reimers & Meyer.	2,500
Crude Rubber Co.	9,000
	93,000

APRIL 24.—By the <i>Sampione</i> =Genoa:	
George A. Alden & Co.	3,500

APRIL 24.—By the <i>Nomadic</i> =Liverpool:	
Davis, Turner & Co.	10,000

EAST INDIAN.

APRIL 1.—By the <i>Cornic</i> =Colombo:	
J. W. Greene & Co.	43,000
Windmuller & Roelker.	11,500
	54,500

APRIL 10.—By the <i>Energia</i> =Singapore:	
D. P. Cruikshank.	23,000
J. W. Greene & Co. (Pontianak).	40,000
George A. Alden & Co. (Pontianak).	235,000
	298,000

APRIL 10.—By the <i>Pathan</i> =Singapore:	
J. W. Greene & Co.	22,000
J. W. Greene & Co. (Pontianak).	48,000
George A. Alden & Co. (Pontianak).	170,000
Reimers & Meyer (Pontianak).	20,000
	260,000

APRIL 17.—By the <i>Bavaria</i> =Calcutta:	
Reimers & Meyer.	5,700

APRIL 17.—By the <i>Indrani</i> =Singapore:	
Reimers & Meyer.	82,000
Reimers & Meyer (Pontianak).	195,000
J. W. Greene & Co. (Pontianak).	102,000
George A. Alden & Co. (Pontianak).	105,000
	434,000

APRIL 17.—By the <i>Commonwealth</i> =Singapore:	
J. W. Greene & Co.	41,000
J. W. Greene & Co. (Pontianak).	85,000
Reimers & Meyer.	12,500
Reimers & Meyer (Pontianak).	386,000
George A. Alden & Co. (Pontianak).	224,000
	766,500

GUTTA-PERCHA.

MARCH 27.—By the <i>Pretoria</i> =Hamburg:	
Robert Soltau & Co.	25,000
APRIL 1.—By the <i>Patria</i> =Hamburg:	
Robert Soltau & Co.	8,000
APRIL 4.—By the <i>Marquette</i> =London:	
Robert Soltau & Co.	26,000
Lamb Manufacturing Co.	3,000
APRIL 17.—By the <i>Commonwealth</i> =Singapore:	
Reimers & Meyer.	15,000
APRIL 17.—By the <i>Indrani</i> =Singapore:	
George A. Alden & Co.	15,000

CUSTOM-HOUSE FIGURES.

PORT OF NEW YORK—MARCH.		
Imports:	POUNDS.	VALUE.
India-rubber.	10,156,736	\$6,381,274
Gutta-percha.	40,083	13,822
Gutta-jelatang (Pontianak).	109,463	2,443
Total.	10,306,282	\$6,397,539
Exports:		
Crude India-rubber.	81,678	\$55,443
Reclaimed rubber.	166,310	21,088

BOSTON ARRIVALS.

MARCH 6.—By the <i>Ottoman</i> =Liverpool:	
Reimers & Meyer—African.	20,000
George A. Alden & Co.—African.	11,989
MARCH 13.—By the <i>Bay State</i> =Liverpool:	
Reimers & Meyer—African.	19,425
MARCH 13.—By the <i>Ultima</i> =Liverpool:	
Livesey & Co.—African.	15,016
MARCH 15.—By the <i>Sachem</i> =Liverpool:	
Livesey & Co.—African.	9,368
George A. Alden & Co.—African.	4,106
MARCH 20.—By the <i>Sylvania</i> =Liverpool:	
Livesey & Co.—African.	6,272
MARCH 23.—By the <i>Roman</i> =Liverpool:	
Livesey & Co.—Centrals.	2,190
MARCH 31.—By the <i>Barrowmore</i> =London:	
Livesey & Co.—Centrals.	665
Total for March.	
	89,170
Total for February.	
	317,800
Total for January.	
	247,345

GUTTA-PERCHA.

MARCH 3.—By the <i>Assyria</i> =Hamburg:	
Reimers & Meyer.	5,265

NEW ORLEANS.

MARCH.		
	POUNDS.	VALUE.
From Honduras.	339	\$ 339
From Nicaragua.	40,857	32,062
Total.	41,196	\$32,401

